# Test Bank for Fundamentals of Business Mathematics in Canada 3rd Edition by Jerome

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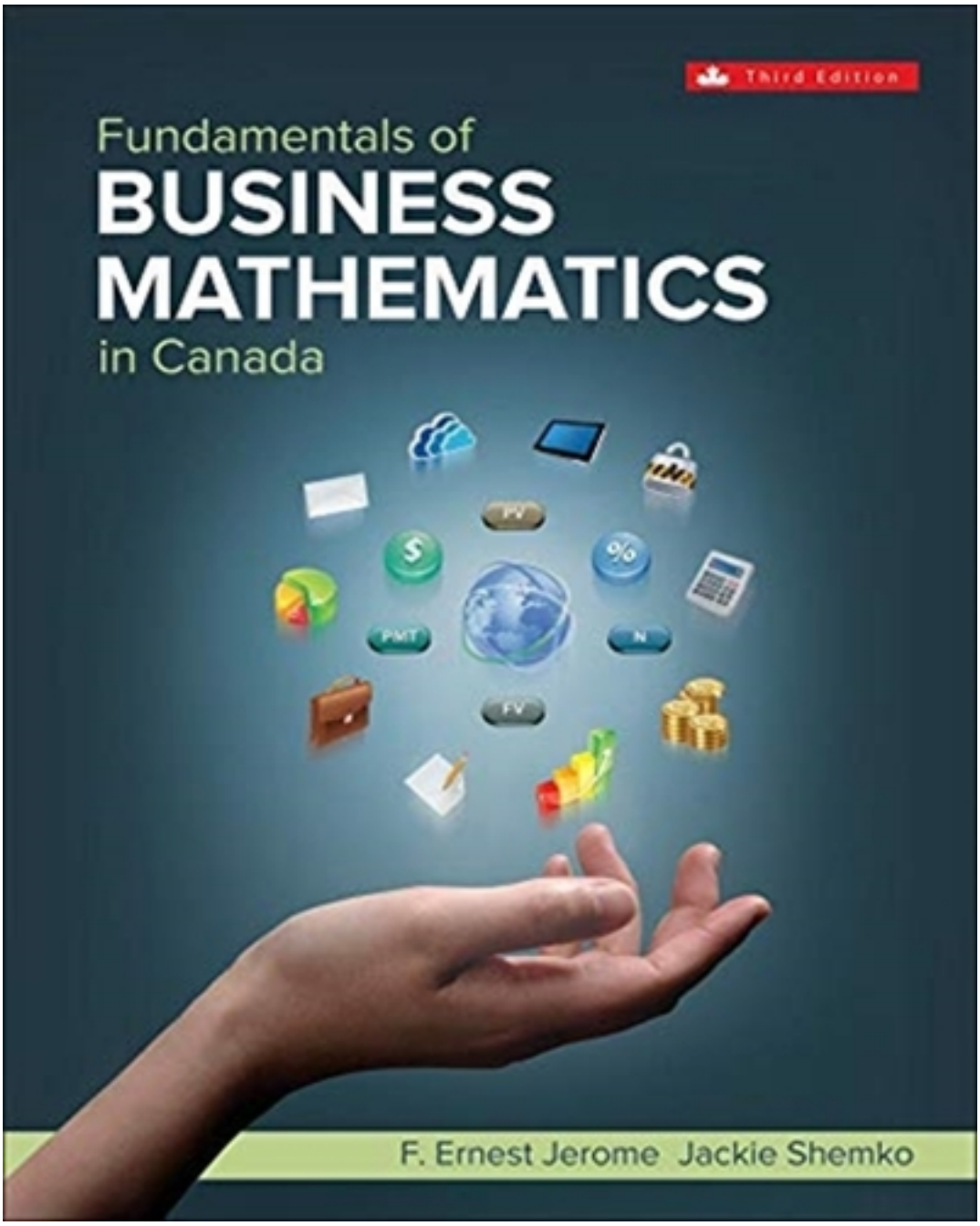



# Test Bank

# Chapter 02
# Review and Applications of Algebra

**Multiple Choice Questions**

1. Evaluate: $L(1 - d_1)(1 - d_2)$ for L = \$1000, $d_1 = 0.30$, and $d_2 = 0.20$.
A. \$440.00
B. \$500.00
C. \$1785.71
**D.** \$560.00
E. \$600.00

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-05 Substitution*

2. Simplify and collect like terms: -a + (2b - c) - (a -b +c)
**A.** -2a + 3b - 2c
B. -2a + b - 2c
C. 3b - 2c
D. -2a + 3b
E. -2a + 2b - 2c

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-03 Addition and Subtraction*

3. Simplify and collect like terms: 1 - (3x - xy + y) - (-x + y - 5xy)
A. 1 - 2x - 2y - 6xy
**B.** 1 - 2x - 2y + 6xy
C. 1 - 4x - 2y + 6xy
D. 1 - 2x - 2y + 4xy
E. 1 - 4x - 2y - 6xy

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-03 Addition and Subtraction*

4. 2(b - 2) - (b - 2) =
A. b + 6
B. 3b - 2
C. 3b + 2
**D.** b - 2
E. b - 6

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-03 Addition and Subtraction*

5. Simplify and collect like terms: 3(x - 2y)(2x + y)
A. $6x^2 - 6xy - 6y^2$
B. $6x^2 + 10xy - 6y^2$
**C.** $6x^2 - 9xy - 6y^2$
D. $6x^2 - 9xy + 6y^2$
E. $6x^2 + 10xy + 6y^2$

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-04 Multiplication and Division*

6. Simplify and collect like terms: 9x - [4y - 3(x - y)]
A. 12 x + 7y
B. 6x - 7y
C. 6x + 7y
**D.** 12x - 7y
E. 9x - 7y

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-03 Addition and Subtraction*

7. Simplify and collect like terms:

$$\frac{12xy - 6y^2}{3y}$$

A. 4x + 2y
B. 4xy - 2y
C. $4xy + 2y^2$
**D.** 4x - 2y
E. $4xy - 2y^2$

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-04 Multiplication and Division*

8. Simplify and collect like terms:

$$\frac{10xy^2 - 15x^3y^2 + 25xy^4}{5xy}$$

A. $2y^2 - 3x^2y + 5y^3$
B. $2xy - 3x^2y + 5y^3$
C. $2y - 3x^2y + 5y$
D. $2y - 3x^2 + 5y$
**E.** $2y - 3x^2y + 5y^3$

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-04 Multiplication and Division*

9. The following algebraic expression $3ab^2 - 4a^2 + 2$, can be classified as:
A. monomial
B. binomial
**C.** trinomial
D. multinomial
E. All choices are incorrect

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-02 Definitions*

10. The following numerical coefficient(s) of $3ab^2 - 4a^2 + 2$, is/are:
A. -4,2
B. 3,4
C. 2
D. 3,-4,2
**E.** 3,-4

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-02 Definitions*

11. The following algebraic expression $-7xy + 2x,$ can be classified as:
A. monomial
**B.** binomial
C. trinomial
D. multinomial
E. All choices are incorrect

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-02 Definitions*

12. Simplify and collect like terms:

$\frac{4x + 5}{8} - 2.1(x - 7)$
A. -1.6x - 14.075
B. -1.6x - 15.325
C. 2.6x + 15.325
D. 2.6x - 14.075
**E.** -1.6x + 15.325

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-03 Addition and Subtraction*

13. Simplify:

$$\frac{6a+9}{3} - 4(a-1)$$

A. -2a + 13
B. -2a - 1
**C.** -2a + 7
D. 2a + 7
E. 2a - 1

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-03 Addition and Subtraction*

14. Simplify the following: $a^2 \times a^6 \times a$
A. $a^8$
B. $a^7$
**C.** $a^9$
D. $a^{12}$
E. $a^{13}$

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

15. Simplify the following: $(a^2)(a^{-6})(a^3)$
A. $a^{11}$
B. a
C. $a^{-36}$
**D.** $a^{-1}$
E. $a^{-5}$

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

16. Simplify the following: $b^8 \div b^2$
A. $b^4$
B. $b^{10}$
C. $b^{16}$
D. $b^{-6}$
**E.** $b^6$

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

17. Simplify the following: $y^8 \div y^5$
**A.** $y^{13}$
B. $y^3$
C. $y^{-40}$
D. $y^{40}$
E. $y^{-13}$

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

18. Simplify the following: $(x^5)^4$
A. $x^9$
**B.** $x^{20}$
C. $x$
D. $x^{-1}$
E. $x^0$

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

19. Simplify the following: $(2x^3)^5$
A. $10x^{15}$
B. $32x^8$
**C.** $32x^{15}$
D. $2x^{15}$
E. $2x^8$

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

20. Simplify the following:

$$\frac{(x^5)(x)(x^{-3})}{x^{-4}}$$

A. $x^{-1}$
B. $x^6$
C. $x^{-2}$
**D.** $x^7$
E. $x^2$

*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

21. Simplify the following:

$$\frac{(a^3)^{-2}}{a^6}$$

A. $a^0$
B. a
C. $a^{-11}$
D. $a^{-5}$
**E.** $a^{-12}$

*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

22. Simplify the following:

$$\frac{(2a^3b^2)^4}{a^2b^3}$$

**A.** $16a^{10}b^5$
B. $2a^{10}b^5$
C. $16a^3b^3$
D. $2a^5b^5$
E. $16a^5b^3$

*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

23. Simplify the following:

$$\left(\frac{4x}{2x^3}\right)^{-2}\left(\frac{3y^2}{2y^3}\right)^{2}\left(\frac{3xy}{5}\right)^{-1}$$

A. $\frac{5x^2}{16y^3}$

**B.** $\frac{15x^3}{16y^3}$

C. $\frac{5x^3}{8y^2}$

D. $\frac{15x^3}{4y^3}$

E. $\frac{5x^2}{8y^2}$

*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

24. Simplify: 8 - (2x + 4y - 3) - (4y + 10)

A. -8y - 2x + 21

**B.** -8y - 2x + 1

C. -8y - 2x - 2

D. -2x + 1

E. -2x + 21

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-03 Addition and Subtraction*

25. (5x - 2y)(x - 2y) =

A. $5x^2 - 12xy - 4y^2$

B. $5x^2 + 8xy - 4y^2$

**C.** $5x^2 - 12xy + 4y^2$

D. $5x^2 - 8xy + 4y^2$

E. $5x^2 + 12xy + 4y^2$

*Accessibility: Keyboard Navigation*
*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-04 Multiplication and Division*

26. Simplify and collect like terms:

$$\frac{x}{5}+\frac{2}{5}-0.7x^2-\frac{3}{5}x+\frac{3}{4}$$

**A.** $-0.7x^2 - .4x + 1.15$
B. $0.7x^2 - .4x + 1.15$
C. $-0.7x^2 - .4x + .35$
D. $0.7x^2 - .4x + .35$
E. $-0.7x^2 + .8x + 1.15$

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-03 Addition and Subtraction*

27. Simplify and collect like terms:

$$\frac{P}{1+0.07\times\frac{5}{12}}+2P(1+0.07\times\frac{4}{12})$$

A. 3.076P
**B.** 3.018P
C. 2.787P
D. 3.532P
E. 2.956P

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-03 Addition and Subtraction*

28. Simplify and collect like terms:

$$x(1+0.045\times\frac{55}{365})+\frac{2x}{(1-0.045\times\frac{200}{365})}$$

A. 2.957*x*
B. 2.208*x*
**C.** 3.057*x*
D. 2.068*x*
E. 1.983*x*

*Difficulty: Difficult*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-03 Addition and Subtraction*

29. Evaluate: -4(r - t) - (2r - 4t) for r = 1/2 and t = 1/4.
A. 1
B. 5
C. 3
D. -5
**E.** -1

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-05 Substitution*

30. Evaluate the following expression: 3x + 4y -6xy, for x = 2, y = -3
**A.** 30
B. -42
C. 54
D. -18
E. 24

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-05 Substitution*

31. Evaluate the following expression: $P(1 + rt)$, for $P$ = \$1575, $r$ = .055,

$$t = \frac{168}{365}$$

A. \$39.87
**B.** \$1614.87
C. \$1973.71
D. \$16,128
E. \$724.96

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-05 Substitution*

32. Evaluate the following: $25^{3/2}$
A. 8.6
B. 37.5
**C.** 125
D. 5
E. 625

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

33. Evaluate the following: $-16^{5/4}$
A. 32
B. 64
C. -64
**D.** -32
E. 10

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

34. Evaluate the following: $2.48832^{1/5}$ =
A. 95.396217
B. 0.0104826
**C.** 1.2
D. 3.0
E. 0.8333333

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

35. Evaluate the following:

$\sqrt[4]{(121.89)^2}$

A. 14,857.17
B. 487.56
C. 3714.29
D. 60.945
**E.** 11.04

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

36. Evaluate the following:

$$\frac{1.04^{10} - 1}{0.04}$$

**A.** 12.006
B. 698.137
C. 1.201
D. 36.006
E. 35.58

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

37. Evaluate the following:

$$\frac{1.055^{6} - 1}{0.055}$$

A. 233.95
**B.** 6.888
C. 0.689
D. 23.395
E. 23.763

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

38. Evaluate the following:

$$\frac{1-1.075^{-8}}{0.075}$$

A. -5.857
B. -10.446
**C.** 5.857
D. 0.5857
E. 13.485

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

39. Evaluate the following:

$$\frac{1-1.056^{-15}}{0.056}$$

A. -9.971
B. -22.579
C. 58.29
**D.** 9.971
E. 25.743

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

40. Evaluate the following:

$$\left(\frac{r^3t^4}{t}\right)^3$$

=
A. $r^9t^4$
B. $r^6t^6$
C. $r^6t^7$
D. $r^9t^{11}$
**E.** $r^9t^9$

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

41. Evaluate the following:

$$\frac{(r^9)^2(r^6)}{r^{12}}$$

=

A. $r^5$
B. $r^{17/12}$
**C.** $r^{12}$
D. $r^2$
E. $r^{36}$

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

42. $(8^2)(2^{-4})(-2)^2$ =

A. 1024
B. 256
C. 4
D. 48
**E.** 16

*Accessibility: Keyboard Navigation*
*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

43. Calculate the final result to two decimal places, where x = $6.80

$$\frac{3x}{1.065} + \frac{8.3x}{13} + .07(8.8x - 20)$$

**A.** $26.28
B. $27.38
C. $28.48
D. $18.58
E. $30.28

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-05 Substitution*

44. Calculate the final result to two decimal places, where f = $8.25

$$\frac{f}{(1+.067)^3} - 4f(1-.067)^4$$

A. -15.22
**B.** - 18.22
C. 12.22
D. 15.22
E. 18.22

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-05 Substitution*

45. Calculate the final result to two decimal places, where z = .1515

$$\frac{z}{4} + z^4 + \frac{7}{9} - .25z^2 + \frac{2}{3}$$

A. .48
B. 2.65
**C.** 1.48
D. 3.22
E. 5.48

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-05 Substitution*

46. Calculate the result to the nearest cent given n = 3; $i$ = .087 and R = $925

$$\frac{R}{i}\left[1 - \frac{1}{(1+i)^n}\right]$$

A. $18,716.57
B. $22,512.13
C. $5,341.55
**D.** $2,354.02
E. $2,158.21

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-05 Substitution*

47. Calculate the result to two decimal places given t = 1.25

$(t^8)^{\frac{5}{6}}$

**A.** 4.43
B. 5.27
C. 3.85
D. 4.67
E. 3.10

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-05 Substitution*

48. Calculate the result to four decimal places given r = 1.3 and t = 2.6

$$\frac{5r^6t^8}{(7r^2t)^4}$$

A. 1.0683
**B.** .0563
C. .0885
D. 1.2573
E. 6.2675

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-05 Substitution*

49. Solve the following to four decimal places

$$\frac{1 + 1.0385^{-5}}{.0385}$$

A. 49.5768
B. 45.1526
**C.** 47.4774
D. 21.6818
E. 32.9871

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

50. Solve the following to four decimal places

$$\left[\left(\frac{2}{3}\right)^{-4}\right]^{-2}$$

A. 1.0390
B. 0.0678
C. 0.0412
**D.** 0.0390
E. 0.0098

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

51. Evaluate the following:

$$\left(\frac{4}{3}\right)^{2}\left(\frac{3}{4}\right)^{-3}\left(\frac{4}{3}\right)^{-5}$$

A. $\frac{4}{3}$
B. $\frac{3}{4}$
C. $\frac{16}{3}$
D. $\frac{4}{9}$
**E.** 1

*Difficulty: Difficult*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

52. Solve for the unknown rounded to the nearest dollar.

$$\frac{x}{1.036^4} + 4x(2.6)^{-2} = 2{,}189.70$$

**A.** 1,500
B. 2,500
C. 1,750
D. 3,750
E. 875

*Difficulty: Difficult*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-09 Solving a Linear Equation in One Unknown*

53. Solve for the unknown rounded to the nearest cent.

$$\frac{5x}{1.06^{-3}} + x + x(1.25)^4 = 925$$

A. 108.74
**B.** 98.44
C. 68.41
D. 15.25
E. 88.67

*Difficulty: Difficult*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-09 Solving a Linear Equation in One Unknown*

54. Solve for the unknown rounded to two decimal places

$$\frac{4x}{1.15^3} - 1{,}000 - \frac{x}{1.098^6} = \frac{4{,}580}{1.25^{-2}}$$

A. 1,875.13
B. 2,388.44
**C.** 3,960.51
D. 4,137.68
E. 5,408.77

*Difficulty: Difficult*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-09 Solving a Linear Equation in One Unknown*

55. Solve for x and y:

x + y = 40
-x + y = -20
**A.** x = 30; y = 10
B. x = - 10; y = 30
C. x = - 30; y = - 10
D. x = - 60; y = 20
E. x = - 60; y = - 20

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-10 Solving Two Linear Equations in Two Unknowns*

56. Solve for x and y:

2x + 3y = 7
3x - y = 5
A. x = 6; y = 2
B. x = - 2; y = 1
C. x = - 2; y = - 1
**D.** x = 2; y = 1
E. x = 2; y = - 1

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-10 Solving Two Linear Equations in Two Unknowns*

57. Solve for x:

$-\left(\frac{1}{2}x-5\right)$

= 2x - 10
**A.** 6
B. -6
C. -10
D. $3\frac{1}{3}$
E. 10

*Difficulty: Easy*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-09 Solving a Linear Equation in One Unknown*

58. Solve for x: 2x + $\frac{1}{8}$x = x + 10

A. $3\frac{1}{5}$

**B.** $8\frac{8}{9}$

C. $-3\frac{1}{5}$

D. $4\frac{12}{17}$

E. $\frac{9}{80}$

*Difficulty: Moderate*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-09 Solving a Linear Equation in One Unknown*

59. Solve for x and y in the following pair of equations:

y = -0.2x + 4.2
x - 0.5y = 10

**A.** x = 11; y = 2
B. x = 2; y = 11
C. x = 11; y = 6.4
D. x = 6.45; y = 2.9
E. x = 6.4; y = 11

*Accessibility: Keyboard Navigation*
*Difficulty: Moderate*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-10 Solving Two Linear Equations in Two Unknowns*

60. Solve for x: 2/3 ( x + 3) = -1/2 (6 x + 20) + 15

A. $2\frac{5}{6}$

**B.** $\frac{9}{11}$

C. 1.5

D. $-2\frac{13}{22}$

E. 3.875

*Difficulty: Difficult*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-09 Solving a Linear Equation in One Unknown*

61. Solve for the unknown rounded to two decimal places

$$\frac{8x}{1.22^{-4}} + 2{,}000 = \frac{7{,}820}{2.05^{3}} + \frac{x}{1.011^{5}}$$

A. 17.68
B. 24.67
C. -24.22
**D.** -65.11
E. -85.28

*Difficulty: Difficult*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-09 Solving a Linear Equation in One Unknown*

62. Solve for x:

$$\frac{x}{1.5^{2}} + 3x(1.5)^{2} = 100$$

A. 13.9082
**B.** 13.8996
C. 14.8148
D. 25.0000
E. 225.0000

*Difficulty: Difficult*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-09 Solving a Linear Equation in One Unknown*

63. What is the range of y given the domain x = -3 to x = 5 for the equation -3x + y = 15?
A. 0 to 24
**B.** 6 to 30
C. 24 to 30
D. -6 to -3.3
E. 0 to 30

*Accessibility: Keyboard Navigation*
*Difficulty: Moderate*
*Learning Objective: 02-04 Graph a linear equation in two variables*
*Topic: 02-12 Graphing a Linear Equation in Two Unknowns*

64. The retail price of a sweater is $161.00, which includes a markup of 40% of cost. What is the cost price of the sweater?
**A.** $115
B. $70.84
C. $64.40
D. $96.60
E. $100.63

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

65. Sam has $20,000 to invest. He invested part at 5% and part at 6%. His investments earned $1,120 total interest for the year. How much did Sam invest at each rate?
A. $12,000; $8000
B. $10,000; $10,000
C. $6000; $14,000
D. $14,000; $6000
**E.** $8000; $12,000

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

66. Anders has $35,000 to invest. He invested part at 5.5% and part at 7%. His investments earned $2,195 total interest for the year. How much did Anders invest at each rate?
**A.** $17,000; $18,000
B. $18,000; $17,000
C. $20,000; $15,000
D. $15,000; $20,000
E. $10,000; $25,000

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

67. Tickets for the school play were $3 for students and $5 for all others. The box office sold 750 tickets for a total of $3,200. How many student tickets were sold?
A. 475
**B.** 275
C. 500
D. 250
E. 300

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

68. The retail price of a packaged CD is $60.00, which includes a markup of 150% of cost. What is the cost price of the CD?
A. $40
**B.** $24
C. $36
D. $20
E. $32

*Accessibility: Keyboard Navigation*
*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

69. An employee earns $1,562.50 for 55 hours of work during last week. His regular workweek is 40 hours and he gets overtime at time and one-half the regular rate of pay. What is the regular hourly rate of pay?
A. $37.50
B. $28.41
C. $42.61
D. $58.59
**E.** $25.00

*Accessibility: Keyboard Navigation*
*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

70. It takes 40 minutes to produce product A and 60 minutes to produce product B. Last week 60 hours were used in manufacturing both products. A total of 140 units were produced. Determine the number of product A and B produced.
A. Product A = 100; Product B = 40
**B.** Product A = 40; Product B = 100
C. Product A =80; Product B = 60
D. Product A = 70; Product B = 70
E. Product A = 60; Product B = 80

*Accessibility: Keyboard Navigation*
*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

71. The stock market index decreased this month by one-thirteenth of last month's index. If this month's index is 2,400, what was last month's index?
A. 2,585
B. 2,320
C. 2,483
**D.** 2,600
E. 2,215

*Accessibility: Keyboard Navigation*
*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

72. The commission on a transaction is 3% of the first $100,000 and 2% of the balance. What was the amount of a transaction where the commission charged was $10,100?
A. $225,000
B. $545,000
C. $310,000
D. $355,000
**E.** $455,000

*Accessibility: Keyboard Navigation*
*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

73. At a United Way fund raiser, students sold cinnamon buns for $2 each or 3 for $5. They sold 500 all together, and raised $900. How many of the 3 for $5 were sold?
A. 100
B. 200
**C.** 300
D. 250
E. 150

*Accessibility: Keyboard Navigation*
*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

74. Stavros sells gold and green fabric in his drapery store. He buys the same quantity of both each quarter for $18 per metre for the gold fabric and $20 for the green fabric. His last order totalled $2,290. The supplier has advised Stavros that the gold fabric will increase by 20% and the green fabric by 25%, and his total order for the next quarter will be $2813. How many metres of gold fabric does Stavros order each quarter?
A. 65
B. 56
C. 85
**D.** 55
E. 25

*Accessibility: Keyboard Navigation*
*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

75. If actual sales of $18,000 were 36% of budgeted sales, what were the budgeted sales?
**A.** $50,000
B. $52,920
C. $25,920
D. $10,080
E. $46,080

*Accessibility: Keyboard Navigation*
*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

76. A company laid off 80% of its work force. The number of employees after the layoff is 3,000. How many employees were there before the layoff?
A. 5,400
B. 7,200
C. 3,600
**D.** 15,000
E. 3,750

*Accessibility: Keyboard Navigation*
*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

77. Bart purchased three-quarters of a 32% interest in a Swiss Chalet franchise for $270,000. What is implied value of the franchise?
A. $115,200
B. $632,800
C. $980,750
**D.** $1,125,000
E. $1,625,000

*Accessibility: Keyboard Navigation*
*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

78. A project manager needs to allocate a staff of 460 employees to a 3-stage project. Stage 2 must have 20% more staff than Stage 1. Stage 3 required 50% more than Stage 2. Determine the number of employees needed for stage 1, 2 and 3 respectively.
**A.** Stage 1 = 115; Stage 2 = 138; Stage 3 = 207
B. Stage 1 = 120; Stage 2 = 120; Stage 3 = 320
C. Stage 1 = 320; Stage 2 = 120; Stage 3 = 120
D. Stage 1 = 207; Stage 2 = 115; Stage 3 = 138
E. Stage 1 = 200; Stage 2 = 100; Stage 3 = 60

*Accessibility: Keyboard Navigation*
*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

79. A moving company charges an hourly rate plus a per kilometer rate. Sam paid $128.50 for his rental, having traveled 77Km over a 6 hour period. Taylor paid $205 for her rental, having traveled 140 km over a nine hour period. Determine the hourly rate and per Km rate charged by the rental company.
A. Hourly rate = $20; Km rate = $.25
B. Hourly rate = $18; Km rate = $.50
**C.** Hourly rate = $15; Km rate = $.50
D. Hourly rate = $12; Km rate = $.75
E. Hourly rate = $15; Km rate = $.75

*Accessibility: Keyboard Navigation*
*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

80. Ajax Corporation has $48,000 to spend on advertising and is considering radio, television and newspaper ads. For radio ads, Ajax will spend a quarter of what it will spend on newspaper ads. For television ads, it will also spend 70% of what it will spend on radio ads. How much will the company spend on radio, newspaper and television ads respectively?
**A.** radio = $8,421; newspaper = $33,684; television = $5,985
B. radio = $5,985; newspaper = $33,684; television = $8,421
C. radio = $33,684; newspaper= $5,985; television = $8,421
D. radio = $12,000; newspaper = $24,000; television = $12,000
E. radio = $6,000; newspaper = $30,000; television = $12,000

*Accessibility: Keyboard Navigation*
*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

81. John and Jill agree to form a partnership. The partnership agreement requires that John invests $7,000.00 less than one-half of what Jill is to invest. If the total investment of both is $125,000.00, how much is Jill's investment?
**A.** $88,000.00
B. $37,000.00
C. $78,666.67
D. $46,333.33
E. $74,393.33

*Accessibility: Keyboard Navigation*
*Difficulty: Difficult*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

82. The difference between two numbers is 42. If one-half of the larger number is three more than twice the smaller number, what are the two numbers?
A. -12 and -54
**B.** 12 and 54
C. 16.0 and 58.0
D. 11 and 31
E. -12.5 and 29.5

*Accessibility: Keyboard Navigation*
*Difficulty: Difficult*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

83. What was the percent change in unit price when a box of tissues dropped from 200 to 150 tissues per box? (with no change in the price per box)?
A. 25%
B. 20%
C. 30%
D. 35%
**E.** 33.3%

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

84. What was the percent change in unit price when a box of tissues dropped from 400 to 350 tissues per box? (with no change in the price per box)?
A. 12.5%
B. 15%
C. 17.5%
D. 11.7%
**E.** 14.3%

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

85. What is the percent change in unit price of a bag of cookies if the number of cookies per box is decreased by 15% (with no change in the price per bag)?
**A.** 17.6%
B. 15%
C. 20%
D. 10%
E. 11.1%

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

86. A loan company dropped the interest rate it charges on second mortgages from 9.5% to 7.9%. What percent reduction did this represent?
A. 16%
**B.** 16.8%
C. 1.6%
D. 20.3%
E. 15.7%

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

87. A loan company dropped the interest rate it charges on second mortgages from 8.7% to 7.3%. What percent reduction did this represent?
A. 1.4%
B. 19.2%
**C.** 16.1%
D. 14%
E. 15.6%

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-19 Reversing a Percent Difference*

88. If the Canadian dollar is worth18% less than the U.S. dollar, by what percentage does the U.S. dollar exceed the value of the Canadian dollar?
A. 15%
B. 18%
C. 24%
**D.** 21.95%
E. 20%

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-19 Reversing a Percent Difference*

89. A car dealer normally lists cars at 25% above cost. During a sale the manger offered a 10% reduction. If a car sold for $20,812.50, what was the cost price to the dealership?
**A.** $18,500
B. $23,125
C. $18,315
D. $16,650
E. $17,250

*Accessibility: Keyboard Navigation*
*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

90. If the euro is worth 60% more than the Canadian dollar, how much less (in percentage terms) is the Canadian dollar worth than the euro?
A. 40%
**B.** 37.5%
C. 62.5%
D. 45%
E. 55%

*Accessibility: Keyboard Navigation*
*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-19 Reversing a Percent Difference*

91. If the euro is worth 57% more than the Canadian dollar, how much less (in percentage terms) is the Canadian dollar worth than the euro?
A. 43%
B. 63.7%
**C.** 36.3%
D. 42%
E. 45%

*Accessibility: Keyboard Navigation*
*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-19 Reversing a Percent Difference*

92. What number is 25% less than 96?
A. 120
B. 128
C. 384
**D.** 72
E. 125

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

93. 0.51% of $8500.00 =
A. $43,444.44
B. $1663.04
**C.** $43.35
D. $166,304.35
E. $434.44

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

94. $100 is what percent less than $125?
A. 125%
B. 45%
C. 25%
**D.** 20%
E. 15%

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

95. What sum of money, increased by 7% equals $187.25?
A. $200.36
B. $174.14
C. $180.25
**D.** $175.00
E. $170.00

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

96. 35% of $180.00 is what amount?
**A.** $63.00
B. $243.00
C. $117.00
D. $514.29
E. $276.92

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

97. What number is

$87\frac{1}{2}\%$

less than 250?
A. 218.75
B. 468.75
C. 133.33
D. 383.33
**E.** 31.25

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

98. How much is 600 increased by 44%?
A. 840
B. 644
**C.** 864
D. 1,367
E. 788

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

99. What amount, when reduced by 60% equals $840?
A. $336
B. $900
C. $1,680
D. $1,400
**E.** $2,100

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

100. After a 5.25% raise, Johnny earned $19.28 per hour. What was his hourly rate before the raise?
A. $18.27
**B.** $18.32
C. $20.26
D. $18.78
E. $10.11

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

101. The population of Enfield has increased by 36% over the last five years. If the current population is 89,244 what was it 5 years ago?
**A.** 65,621
B. 53,244
C. 19,182
D. 57,123
E. 70,377

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

102. How much is 50 increased by 300%?
A. 350
B. 300
C. 250
**D.** 200
E. 150

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

103. A retailer purchases merchandise at 25% below the suggested retail price. If the retailer pays $375 for an item, what is the suggested retail price?
A. $468.75
**B.** $500.00
C. $525.00
D. $475.00
E. $450.00

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

104. The share value of Rip-off Technologies has dropped this year by 85%, to a new low of $7.50 per share. How much money has been lost per share?
**A.** $42.50
B. $63.75
C. $8.82
D. $92.50
E. $15.00

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

105. During the last 30 years the price of gasoline has increased by 440%. If the current price per litre is $0.589, what was it 30 years ago?
A. $0.201
B. $0.149
C. $0.134
**D.** $0.109
E. $0.037

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

106. After adding

$2\frac{1}{4}\%$

to a sum of money, the new amount is $45,000.00. What was the original amount of money?
A. $43,987.50
**B.** $44,009.78
C. $2,000,000.00
D. $46,035.81
E. $20,000.00

*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

107. Susan is paid a 15% commission of her sales. If she earns a commission of $3800, what was the amount of her sales?
A. $44,705.88
**B.** $25,333.33
C. $4470.59
D. $7030.00
E. $3230.00

*Accessibility: Keyboard Navigation*
*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

108. An item listed at 40% above cost was sold by a dealer during a special sale at a 15% reduction from the list price. What did the item cost the dealer if it was sold for $23,765.00?
A. $23,494.81
B. $33,271.00
**C.** $19,970.59
D. $27,958.82
E. $43,965.25

*Accessibility: Keyboard Navigation*
*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

109. After real estate fees of 3% had been deducted from the proceeds of the sale of a property, the real estate agent sent the vendor (seller) of the property $244,400. What was the amount of fees retained by the real estate agent?

**A.** $7,558.76
B. $251,958.76
C. $7,800.00
D. $7,118.45
E. $237,281.55

*Accessibility: Keyboard Navigation*
*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

110. The retail price of an item is $625.50. This includes a markup of three-quarters of the wholesale cost to the retailer. What is the wholesale cost?

A. $1,094.63
B. $469.13
C. $834.00
D. $156.38
**E.** $357.43

*Accessibility: Keyboard Navigation*
*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

111. New computer hardware uses 40% less energy than the current model. How much more efficient is the new computer?

A. 100%
B. 60%
C. 40%
**D.** 67%
E. 33%

*Accessibility: Keyboard Navigation*
*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-19 Reversing a Percent Difference*

112. The Vancouver Real Estate Board stated that the average house price was $405,000 this year; an 8% increase over the same time last year. Determine the average house price last year.
A. 355,000
B. 365,000
**C.** 375,000
D. 385,000
E. 395,000

*Accessibility: Keyboard Navigation*
*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

113. BCIT is considering decreasing its student to teacher ratio by 20%. Currently there are 35 students per instructor. By what amount should instructors be increased?
**A.** 25%
B. 20%
C. 45%
D. 15%
E. 10%

*Accessibility: Keyboard Navigation*
*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

114. A car dealership's list price on cars is 18% above cost. Recently a demo was sold for $21,000, which is 15% off the list price. Determine the cost of the demo vehicle.
A. $21,500
**B.** $20,937
C. $20,500
D. $19,750
E. $17,750

*Accessibility: Keyboard Navigation*
*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

**True / False Questions**

115. The final value of $(d^7)^4$ is $d^{11}$.
**FALSE**

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

116. The final value of

$$\frac{(b^{10})(b^{18})}{b^{15}}$$

is $b^{13}$.
**TRUE**

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

117. When x is 3, the result of $5x^3 + 7x^2 - 30$ is 127.
**FALSE**

*Accessibility: Keyboard Navigation*
*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-05 Substitution*

118. When N = \$135 and d = .085, the result of

$$\frac{N}{1+d}$$

is \$124.42.
**TRUE**

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-05 Substitution*

119. When x = 6, then the result of

$$\frac{5x+12}{7} - 1.5(x-2)$$

is 0.

**TRUE**

*Difficulty: Moderate*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-05 Substitution*

120. The final value of

$15^{\frac{2}{3}}$

is 10.25

**FALSE**

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

121. The value of c is 4 given the formula 21*c* - 15 = 18 - 12*c*.

**FALSE**

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-09 Solving a Linear Equation in One Unknown*

122. The final value of x is 134.40 given the formula

$$\frac{x}{1.2^3} + 3x(1.4)^2 = 1{,}500$$

**FALSE**

*Difficulty: Difficult*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-09 Solving a Linear Equation in One Unknown*

123. The final value of x is 325.25 given the formula

$$x(1.08)^5 + 1{,}500 + \frac{x}{1.04^{-3}} = \frac{2{,}800}{1.04^6}$$

**FALSE**

*Difficulty: Difficult*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-09 Solving a Linear Equation in One Unknown*

124. 75 is 20% more than 60.
**FALSE**

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

125. The net amount after a 34% reduction on $180 is $122.50.
**FALSE**

*Accessibility: Keyboard Navigation*
*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

**Short Answer Questions**

126. Simplify and collect like terms: $(-p) + (-3p) + (4p)$

0

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-03 Addition and Subtraction*

127. Simplify and collect like terms: $(5s - 2t) - (2s - 4t)$

$3s + 2t$

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-03 Addition and Subtraction*

128. Simplify and collect like terms: $4x^2y + (-3x^2y) - (-5x^2y)$

$6x^2y$

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-03 Addition and Subtraction*

129. Simplify and collect like terms: $1 - (7e^2 - 5 + 3e - e^3)$

$e^3 - 7e^2 - 3e + 6$

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-03 Addition and Subtraction*

130. Simplify and collect like terms: $(6x^2 - 3xy + 4y^2) - (8y^2 - 10xy - x^2)$

$7x^2 + 7xy - 4y^2$

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-03 Addition and Subtraction*

131. Simplify and collect like terms: $6a - 3a - 2(2b - a)$

$5a - 4b$

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-03 Addition and Subtraction*

132. Perform the operation indicated and collect like terms: $4a(3ab - 5a + 6b)$

$12a^2b - 20a^2 + 24ab$

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-04 Multiplication and Division*

133. Perform the operation indicated and collect like terms: $9k(4 - 8k + 7k^2)$

$36k - 72k^2 + 63k^3$

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-04 Multiplication and Division*

134. Perform the operation indicated and collect like terms: $-5xy(2x^2 - xy - 3y^2)$

$-10x^3y + 5x^2y^2 + 15xy^3$

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-04 Multiplication and Division*

135. Perform the operation indicated and collect like terms: $(3p^2 - 5p)( -4p + 2)$

$-12p^3 + 26p^2 - 10p$

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-04 Multiplication and Division*

136. Perform the operation indicated and collect like terms: $3(a - 2)(4a + 1) - 5(2a + 3)(a - 7)$

$2a^2 + 34a + 99$

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-04 Multiplication and Division*

137. Perform the operation indicated and collect like terms: $5(2x - y)(y + 3x) - 6x(x - 5y)$

$24x^2 + 25xy - 5y^2$

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-04 Multiplication and Division*

138. Perform operations and gather like terms: $6(4y - 3)(2 - 3y) - 3(5 - y)(1 + 4y)$

$-60y^2 + 45y - 51$

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-04 Multiplication and Division*

139. Multiply and collect like terms: $4(3a + 2b)(2b - a) - 5a(2a - b)$

$-22a^2 + 21ab + 16b^2$

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-04 Multiplication and Division*

140. Perform the operation indicated and collect like terms:

$$\frac{18x^2}{3x}$$

6x

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-04 Multiplication and Division*

141. Perform the operation indicated and collect like terms:

$$\frac{6a^2b}{-2ab^2}$$

$$\frac{-3a}{b}$$

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-04 Multiplication and Division*

142. Perform the operation indicated and collect like terms:

$$\frac{x^2y - xy^2}{xy}$$

x - y

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-04 Multiplication and Division*

143. Perform the operation indicated and collect like terms:

$$\frac{-4x + 10x^2 - 6x^3}{-0.5x}$$

$8 - 20x + 12x^2$

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-04 Multiplication and Division*

144. Perform the operation indicated and collect like terms:

$$\frac{12x^3 - 24x^2 + 36x}{48x}$$

$$\frac{x^2 - 2x + 3}{4}$$

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-04 Multiplication and Division*

145. Perform operations and gather like terms:

$$\frac{5b-4}{4}-\frac{25-b}{1.25}+\frac{7}{8}b$$

2.925b - 21

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-04 Multiplication and Division*

146. Perform operations and gather like terms:

$$\frac{96nm^2-72n^2m^2}{48n^2m}$$

$$\frac{96nm^{\ 2}-72n^{\ 2}m^{\ 2}}{48n^{\ 2}m}=\frac{4m-3nm}{2n}=\frac{4m}{2n}-\frac{3nm}{2n}=2\frac{m}{n}-1.5m$$

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-04 Multiplication and Division*

147. Simplify: $a^2 \times a^3$

$a^5$

*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

148. Simplify: $(x^6)(x^{-4})$

$x^2$

*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

149. Simplify: $b^{10} \div b^{6}$

$b^{4}$

*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

150. Simplify: $h^{7} \div h^{-4}$

$h^{11}$

*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

151. Simplify: $(1 + i)^{4} \times (1 + i)^{9}$

$(1 + i)^{13}$

*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

152. Simplify: $(1 + i) \times (1 + i)^{n}$

$(1 + i)^{n+1}$

*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

153. Simplify: $(x^{4})^{7}$

$x^{28}$

*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

154. Simplify: $(y^3)^3$

$y^9$

*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

155. Simplify: $(t^6)^{1/3}$

$t^2$

*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

156. Simplify: $(n^{0.5})^{8+}$

$n^4$

*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

157. Simplify:

$$\frac{(x^5)(x^6)}{x^9}$$

$x^2$

*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

158. Simplify:

$$\frac{(x^5)^6}{x^9}$$

$x^{21}$

*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

159. Simplify: $[2(1 + i)]^2$

$4(1 + i)^2$

*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

160. Simplify:

$$\frac{9y-7}{3} - 2.3(y-2)$$

$0.7y + 2.2\overline{6}$

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-03 Addition and Subtraction*

161. Simplify and collect like terms:

$$\frac{2x+9}{4} - 1.2(x-1)$$

-0.7x + 3.45

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-03 Addition and Subtraction*

162. Simplify and collect like terms:

$$\frac{x}{2}-x^2+\frac{4}{5}-0.2x^2-\frac{4}{5}x+\frac{1}{2}$$

$-1.2x^2 - 0.3x + 1.3$

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-03 Addition and Subtraction*

163. Simplify and collect like terms:

$$\frac{8x}{0.5}+\frac{5.5x}{11}+0.5(4.6x-17)$$

18.8x - 8.5

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-03 Addition and Subtraction*

164. Simplify and collect like terms:

$$\frac{2x}{1.045}-\frac{2.016x}{3}+\frac{x}{2}$$

1.7419x

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-03 Addition and Subtraction*

165. Perform the operation indicated and collect like terms:

$$\frac{120(1+i)^2+180(1+i)^3}{360(1+i)}$$

$$\frac{2(1+i)+3(1+i)^2}{6}$$

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-04 Multiplication and Division*

166. Simplify:

$$\left(\frac{1+i}{3i}\right)^3$$

$$\frac{(1+i)^3}{27i^3}$$

*Difficulty: Moderate*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

167. Simplify:

$$\frac{4r^5t^6}{(2r^2t)^3}$$

$$\frac{t^3}{2r}$$

*Difficulty: Moderate*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

168. Simplify:

$$\frac{\left(-r^{3}\right)\left(2r\right)^{4}}{\left(2r^{-2}\right)^{2}}$$

$-4r^{11}$

*Difficulty: Moderate*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

169. Evaluate to six-figure accuracy: $(1.0075)^{24}$

1.196414

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

170. Evaluate: $3d^2 - 4d + 15$ for $d = 2.5$

23.75

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-05 Substitution*

171. Evaluate: $15g - 9h + 3$ for $g = 14$, $h = 15$

78

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-05 Substitution*

172. Evaluate: $7x(4y - 8)$ for $x = 3.2$, $y = 1.5$

-44.8

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-05 Substitution*

173. Evaluate: $I$ ¸ $Pr$ for $P$ = \$500, $I$ = \$13.75, $r$ = 0.11

0.250

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-05 Substitution*

174. Evaluate and calculate to the cent:

$$\frac{N}{1-d}$$

for $N$ = \$89.10, $d$ = 0.10

\$99.00

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-05 Substitution*

175. Evaluate and calculate to the cent: $P(1 + rt)$ for $P$ = \$770, $r$ = 0.013,

$$t = \frac{223}{365}$$

\$776.12

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-05 Substitution*

176. Evaluate and calculate to the cent:

$$\frac{S}{1+rt}$$

for $S$ = \$2,500, $r$ = 0.085,

$$t = \frac{123}{365}$$

\$2,430.38

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-05 Substitution*

177. Evaluate to six-figure accuracy: $(1.05)^{1/6} - 1$

0.00816485

*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

178. Evaluate to six-figure accuracy:

$$\frac{(1+0.0075)^{36}-1}{0.0075}$$

41.1527

*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

179. Evaluate to six-figure accuracy:

$$\frac{\left(1.00\overline{6}\right)^{240}-1}{0.00\overline{6}}$$

589.020

*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

180. Evaluate to six-figure accuracy: $(1 + 0.025)^{1/3} - 1$

0.00826484

*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

181. Evaluate and calculate to the cent: $P(1 + i)^n$ for $P$ = \$1,280, $i$ = 0.025, $n$ = 3

\$1,378.42

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-05 Substitution*

182. Evaluate and calculate to the cent:

$$\frac{S}{(1+i)^n}$$

for $S$ = \$850, $i$ = 0.0075. $n$ = 6

\$812.73

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-05 Substitution*

183. Evaluate accurate to the cent: $L(1-d_1)(1-d_2)(1-d_3)$ for $L$ = \$340, $d_1$ = 0.15, $d_2$ = 0.08, $d_3$ = 0.05

\$252.59

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-05 Substitution*

184. Evaluate accurate to the cent:

$$\frac{R}{i}\left[1-\frac{1}{(1+i)^n}\right]$$

for $R$ = \$575, $i$ = 0.085, $n$ = 3

\$1468.56

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-05 Substitution*

185. Using the formula $I = Prt$, solve for P given r=0.30, t=6 and I=$25.50 to the nearest cent.

$14.17

*Difficulty: Moderate*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-06 Manipulating Equations and Formulas*

186. Using the formula S=P(1+rt), solve for r given S=$2250, P=$1500 and t=1.2 to the nearest hundredth.

0.42

*Difficulty: Moderate*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-06 Manipulating Equations and Formulas*

187. Using the formula $c=\frac{V_f-V_i}{V_i}$, solve for $V_f$ given c=0.65 and $V_i$ = $475 to the nearest cent.

$783.75

*Difficulty: Moderate*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-06 Manipulating Equations and Formulas*

188. Evaluate to six-figure accuracy: $8^{4/3}$

16

*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

189. Evaluate to six-figure accuracy: $(-27^{2/3})$

-9

*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

190. Evaluate to six-figure accuracy: $5^{-3/4}$

0.299070

*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

191. Evaluate to six-figure accuracy: $(0.001)^{-2}$

1,000,000

*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

192. Evaluate to six-figure accuracy: $0.893^{-1/2}$

1.05822

*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

193. Evaluate to six-figure accuracy: $(1.0085)^5 (1.0085)^3$

1.07006

*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

194. Evaluate to six-figure accuracy: $(1.0085)^5 (1.0085)^3$

0.985149

*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

195. Evaluate to six-figure accuracy: $(1 + 0.055)^{1/6} - 1$

0.00896339

*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

196. Evaluate to six-figure accuracy:
$\sqrt[3]{1.03}$

1.00990

*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

197. Evaluate to six-figure accuracy:
$\sqrt[6]{1.05}$

1.00816

*Difficulty: Easy*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

198. Evaluate to six-figure accuracy:
$\left[\left(-\frac{3}{4}\right)^2\right]^{-2}$

3.16049

*Difficulty: Moderate*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

199. Evaluate to six-figure accuracy:

$$\left(\frac{2}{3}\right)^3\left(-\frac{3}{2}\right)^2\left(-\frac{3}{2}\right)^{-3}$$

-0.197531

*Difficulty: Moderate*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

200. Evaluate to six-figure accuracy:

$$\frac{1-1.0225^{-20}}{0.0225}$$

15.9637

*Difficulty: Moderate*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

201. Evaluate to six-figure accuracy:

$$\frac{1.03^{16}-1}{0.03}$$

20.1569

*Difficulty: Moderate*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

202. Evaluate and calculate to the cent:

$$R\left[\frac{(1+i)^n-1}{i}\right]$$

for $R$ = \$550, $i$ = 0.085, $n$ = 3

\$1,794.22

*Difficulty: Moderate*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-05 Substitution*

203. Evaluate and calculate to the cent:

$$R\left[\frac{(1+i)^n-1}{i}\right](1+i)$$

for $R$ = \$910, $i$ = 0.1038129, $n$ = 4

\$4687.97

*Difficulty: Moderate*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-05 Substitution*

204. Evaluate and calculate to the cent:

$$R\left[\frac{(1+i)^n-1}{i}\right](1+i)$$

for $R$ = \$630, $i$ = 0.115, $n$ = 2

\$1,071.77
\$4,505.14

*Difficulty: Moderate*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-05 Substitution*

205. Simplify:

$$\frac{\left(-3x^2\right)^3\left(2x^{-2}\right)}{6x^5}$$

$$-\frac{9}{x}$$

*Difficulty: Moderate*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

206. Solve:

$\frac{1}{3}$

$(x - 2) = 4$

x = 14

*Difficulty: Easy*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-09 Solving a Linear Equation in One Unknown*

207. Solve: $y = 192 + 0.04y$

y = 200

*Difficulty: Easy*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-09 Solving a Linear Equation in One Unknown*

208. Solve: $x - 0.025x = 341.25$

x = 350

*Difficulty: Easy*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-09 Solving a Linear Equation in One Unknown*

209. Solve: $12x - 4(2x - 1) = 6(x + 1) - 3$

x = 0.5

*Difficulty: Easy*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-09 Solving a Linear Equation in One Unknown*

210. Solve: $3y - 4 = 3(y + 6) - 2(y + 3)$

y = 8

*Difficulty: Easy*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-09 Solving a Linear Equation in One Unknown*

211. Solve: $8 - 0.5(x + 3) = 0.25(x - 1)$

x = 9

*Difficulty: Easy*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-09 Solving a Linear Equation in One Unknown*

212. Solve: $5(2 - c) = 10(2c - 4) - 6(3c + 1)$

c = 8

*Difficulty: Easy*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-09 Solving a Linear Equation in One Unknown*

213. Solve the following pair of equations. Verify your solution. $x - y = 2$ $3x + 4y = 20$

(4, 2)

*Difficulty: Easy*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-10 Solving Two Linear Equations in Two Unknowns*

214. Solve the following pair of equations. Verify your solution. $y - 3x = 11$ $5x + 30 = 4y$

x = -2, y = 5

*Difficulty: Easy*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-10 Solving Two Linear Equations in Two Unknowns*

215. Solve the following pair of equations. Verify your solution. $7p - 3q = 23$ $-2p - 3q = 5$

p = 2, q = -3

*Difficulty: Easy*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-10 Solving Two Linear Equations in Two Unknowns*

216. Solve the following pair of equations. Verify your solution. $y = 2x$ $7x - y = 35$

x = 7, y = 14

*Difficulty: Easy*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-10 Solving Two Linear Equations in Two Unknowns*

217. Solve each of the following pairs of equations to three-figure accuracy.

a) $4a - 5b = 30$
$2a - 6b = 22$

b) $76x - 29y = 1050$
$-213x - 63y = 250$

a) (5.00, -2.00); b) (11.4, -6.32)

*Difficulty: Moderate*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-10 Solving Two Linear Equations in Two Unknowns*

218. Solve for x to five-figure accuracy:

$$\frac{x}{1.08^3} + \frac{x}{2}(1.08)^4 = \$850$$

$576.63

*Difficulty: Moderate*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-09 Solving a Linear Equation in One Unknown*

219. Solve for x to five-figure accuracy:

$$2x\left(1 + 0.085 \times \frac{77}{365}\right) + \frac{x}{\left(1 + 0.085 \times \frac{132}{365}\right)} = \$1565.70$$

$520.85

*Difficulty: Moderate*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-09 Solving a Linear Equation in One Unknown*

220. Solve for *x* to five-figure accuracy:

$$\frac{2x}{1 + 0.13 \times \frac{92}{365}} + x\left(1 + 0.13 \times \frac{59}{365}\right) = \$831$$

$280.97

*Difficulty: Moderate*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-09 Solving a Linear Equation in One Unknown*

221. Solve for *x* to five-figure accuracy:

$$3x\left(1.03^5\right)+\frac{x}{1.03^3}+x=\frac{\$2500}{1.03^2}$$

$436.96

*Difficulty: Moderate*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-09 Solving a Linear Equation in One Unknown*

222. Solve accurate to the cent:

$$\frac{x}{1.1^2}+2x(1.1)^3=\$1000$$

x = $286.66

*Difficulty: Moderate*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-09 Solving a Linear Equation in One Unknown*

223. Solve accurate to the cent:

$$\frac{3x}{1.025^6}+x(1.025)^8=\$2641.35$$

x = $694.13

*Difficulty: Moderate*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-09 Solving a Linear Equation in One Unknown*

224. Solve the following pair of equations. Verify your solution. -3c + d = - 550 0.7*c* + 0.2*d* = 550

(500, 1,000)

*Difficulty: Moderate*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-10 Solving Two Linear Equations in Two Unknowns*

225. Solve the following pair of equations. Verify your solution. $0.03x + 0.05y = 51$ $0.8x - 0.7y = 140$

(700, 600)

*Difficulty: Moderate*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-10 Solving Two Linear Equations in Two Unknowns*

226. Solve the following pair of equations. Verify your solution. $2v + 6w = 1$ $-9w + 10v = 18$

$\left(\frac{3}{2}, -\frac{1}{3}\right)$

*Difficulty: Moderate*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-10 Solving Two Linear Equations in Two Unknowns*

227. Solve the following pair of equations. Verify your solution. $2.5a + 2b = 11$ $8a + 3.5b = 13$

(-1.72, 7.66)

*Difficulty: Moderate*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-10 Solving Two Linear Equations in Two Unknowns*

228. Solve the following pair of equations. Verify your solution. $37x - 63y = 235$ $18x + 26y = 468$

(17.0, 6.24)

*Difficulty: Moderate*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-10 Solving Two Linear Equations in Two Unknowns*

229. Solve the following pair of equations. Verify your solution. $68.9n - 38.5m = 57$ $45.1n - 79.4m = -658$

(12.8, 8.00)

*Difficulty: Moderate*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-10 Solving Two Linear Equations in Two Unknowns*

230. Solve the following pair of equations. Verify your solution.

$3x + 5y = 11$
$2x - y = 16$

(7, -2)

*Difficulty: Moderate*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-10 Solving Two Linear Equations in Two Unknowns*

231. Solve accurate to the cent:

$$\frac{2x}{1.03^7} + x + x\left(1.03^{10}\right) = \$1000 + \frac{\$2000}{1.03^4}$$

x = $699.47

*Difficulty: Difficult*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-09 Solving a Linear Equation in One Unknown*

232. Solve accurate to the cent:

$$x(1.05)^3 + \$1000 + \frac{x}{1.05^7} = \frac{\$5000}{1.05^2}$$

x = $1892.17

*Difficulty: Difficult*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-09 Solving a Linear Equation in One Unknown*

233. Solve accurate to the cent:

$$x\left(1+0.095\times\frac{84}{365}\right)+\frac{2x}{\left(1+0.095\times\frac{108}{365}\right)}=\$1160.20$$

x = $391.01

*Difficulty: Difficult*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-09 Solving a Linear Equation in One Unknown*

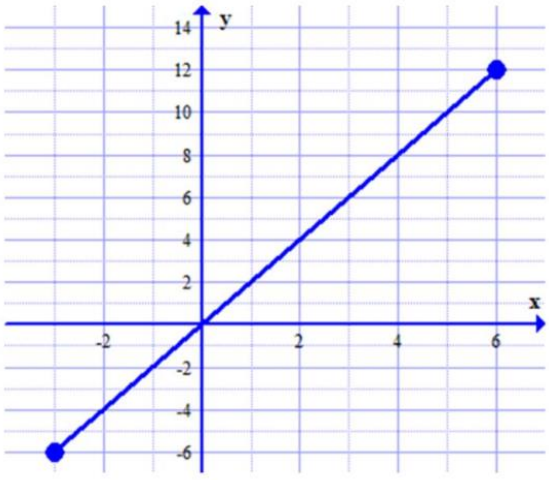
234. Graph the following equation: $-2x + y = 0$ over the range $x = -3$ to $x = 6$

(-3, -6), (0, 0), (6, 12)

*Difficulty: Easy*
*Learning Objective: 02-04 Graph a linear equation in two variables*
*Topic: 02-12 Graphing a Linear Equation in Two Unknowns*

235. Graph following equation: $3x - 4y + 12 = 0$ over the range $x = -8$ to $x = 12$

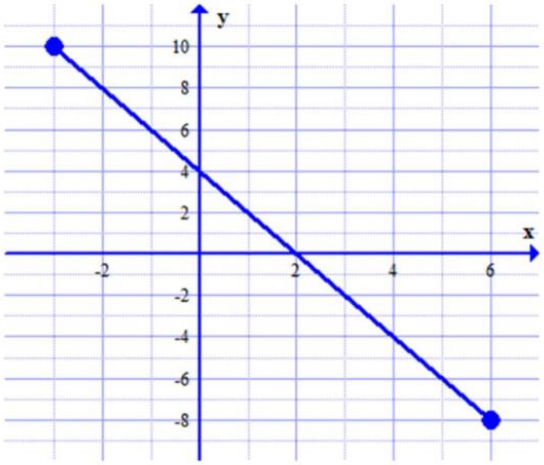
(-8, -3), (0, 3), (12, 12)




*Difficulty: Easy*
*Learning Objective: 02-04 Graph a linear equation in two variables*
*Topic: 02-12 Graphing a Linear Equation in Two Unknowns*

236. Graph following equation: $2x + y = 4$ over the range $x = -3$ to $x = 6$

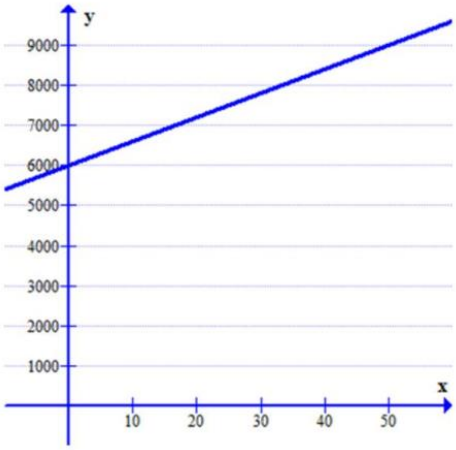
(-3, 10), (0, 4), (6, -8)




*Difficulty: Easy*
*Learning Objective: 02-04 Graph a linear equation in two variables*
*Topic: 02-12 Graphing a Linear Equation in Two Unknowns*

237. Graph the following equation: $y = 60x + 6{,}000$ over the range $x = 0$ to $x = 50$

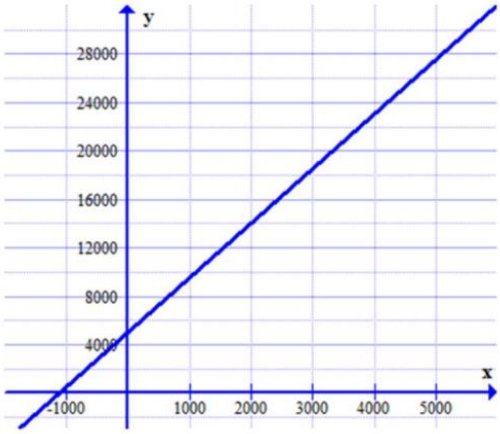
(0, 6,000), (25, 7500), (50, 9,000)




*Difficulty: Easy*
*Learning Objective: 02-04 Graph a linear equation in two variables*
*Topic: 02-12 Graphing a Linear Equation in Two Unknowns*

238. Graph the following equation: $y = 4.5x + 5{,}000$ over the range $x = 0$ to $x = 6{,}000$

(0, 5,000), (3,000, 18,500), (6,000, 32,000)




*Difficulty: Easy*
*Learning Objective: 02-04 Graph a linear equation in two variables*
*Topic: 02-12 Graphing a Linear Equation in Two Unknowns*

239. Determine the slope and *y*-intercept of each of the following equations.

a) $2x = 3y + 4$
b) $8 - 3x = 2y$
c) $8x - 2y - 3 = 0$
d) $6x = 9y$

a) slope = 2/3; intercept = -4/3; b) slope = -3/2; intercept = 4; c) slope = 4; intercept = -3/2; d) slope = -7/8; intercept = 0

*Difficulty: Easy*
*Learning Objective: 02-05 Express a linear equation in slope-intercept form*
*Topic: 02-13 The Slope-Intercept Form of a Linear Equation*

240. A plumber charges a flat $100 for a home service call plus $20 per 15 minutes of labour. Write an equation for calculating the total charges, *C*, in terms of the hours of labour, *H*. If you were to plot a graph of *C* vs. *H*, what would be the slope and *C*-intercept of the line?

C = $80H + $100; slope = $80; intercept = $100

*Difficulty: Easy*
*Learning Objective: 02-05 Express a linear equation in slope-intercept form*
*Topic: 02-13 The Slope-Intercept Form of a Linear Equation*

241. In his sales job, Ehud earns a base salary of $1500 per month plus a commission of 5% on sales revenue. Write an equation for calculating his gross earnings, *E*, for a month in terms of his sales revenue, *R*. If you were to plot a graph of *E* vs. *R*, what would be the slope and *E*-intercept of the line?

E = 0.05R + $1500; slope = 0.05; intercept = $1,500

*Difficulty: Easy*
*Learning Objective: 02-05 Express a linear equation in slope-intercept form*
*Topic: 02-13 The Slope-Intercept Form of a Linear Equation*

242. The formula for converting from Celsius temperatures, *C*, to Fahrenheit temperatures, *F*, is *F* = $\frac{9}{5}$*C* + 32.

a) If you were to plot a graph of *F* vs. *C*, what would be the slope and *F*-intercept of the line?
b) The slope represents the change in *F* per unit change in *C*. Use the value of the slope to determine the increase in Fahrenheit temperature corresponding to a 10 Celsius-degree rise.
c) Rearrange the given formula to obtain a formula for converting from Fahrenheit temperatures to Celsius temperatures. What would be the slope and *C*-intercept if *C* vs. *F* were plotted on a graph?

a) Slope = 9/5; intercept = 32; b) 18F; c) slope = 5/9; intercept = -17
$\frac{7}{9}$

*Difficulty: Moderate*
*Learning Objective: 02-05 Express a linear equation in slope-intercept form*
*Topic: 02-06 Manipulating Equations and Formulas*
*Topic: 02-13 The Slope-Intercept Form of a Linear Equation*

243. Use the graphical method to solve the following pair of equations.

x + y = 2
x = 5

(5,-3)

*Difficulty: Easy*
*Learning Objective: 02-06 Solve two equations in two unknowns by a graphical method*
*Topic: 02-14 Solving Two Equations in Two Unknowns Graphically*

244. Use the graphical method to solve the following pair of equations.

x - 3y = 3
y = -2

(-3,-2)

*Difficulty: Easy*
*Learning Objective: 02-06 Solve two equations in two unknowns by a graphical method*
*Topic: 02-14 Solving Two Equations in Two Unknowns Graphically*

245. Use the graphical method to solve the following pair of equations.

x + y = 4
2x - y = 8

(4, 0)

*Difficulty: Easy*
*Learning Objective: 02-06 Solve two equations in two unknowns by a graphical method*
*Topic: 02-14 Solving Two Equations in Two Unknowns Graphically*

246. Use the graphical method to solve the following pair of equations.

y - 3x = 11
5x + 30 = 4y

(-2, 5)

*Difficulty: Easy*
*Learning Objective: 02-06 Solve two equations in two unknowns by a graphical method*
*Topic: 02-14 Solving Two Equations in Two Unknowns Graphically*

247. A web site had 2/7 more hits last month than in the same month of the preceding year. If there were 2655 hits last month, how many were there 1 year earlier?

2,065

*Difficulty: Easy*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

248. The retail price of a pair of skis consists of the wholesale cost to the retailer plus the retailer's markup. If skis retailing for $712 are marked up by 60% of the wholesale cost, what is that wholesale cost?

$445.00

*Difficulty: Easy*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

249. The price tags in Annie's Flower Shop include the 13% Harmonized Sales Tax (HST). How much HST will she report for a plant sold at $39.95?

$4.60

*Difficulty: Easy*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

250. A stockbroker's commission on a transaction is 2.5% of the first $5,000 of the transaction amount and 1.5% of the remainder. What was the amount of a transaction that generated a total commission of $227?

$11,800

*Difficulty: Easy*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

251. A caterer has the following price structure for banquets. The first 20 meals are charged the basic price per meal. The next 20 meals are discounted by $2 each and all additional meals are each reduced by $3. If the total cost for 73 meals comes to $1686, what is the basic price per meal?

$25.00

*Difficulty: Easy*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

252. The annual dues for the Southern Pines Golf Club are $2140 for regular members and $856 for student members. If the total revenue from the dues of 583 members for the past year was $942,028, how many members did the club have in each category?

238 student members and 345 regular members

*Difficulty: Easy*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

253. Product X requires 30 minutes of machining on a lathe, and product Y requires 45 minutes of machining. If the lathe was operated for 60.5 hours last week for machining a combined total of 93 units of Products X and Y, how many units of each product were produced?

37 units of X and 56 units of Y

*Difficulty: Easy*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

254. Mr. Parker structured his will so that each of his four children will receive half as much from the proceeds of his estate as his wife, and each of 13 grandchildren will receive one-third as much as each child. After his death, $759,000 remains after expenses and taxes for distribution among his heirs. How much will each child and grandchild receive?

each child = $73,451.62; each grandchild = $24,483.87

*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

255. To coordinate production in a three-stage manufacturing process, Stage B must be assigned 60% more workers than Stage A. Stage C requires three-quarters as many workers as Stage B. How should the foreman allocate 114 workers among the three stages?

Stage A = 30; Stage B = 48; Stage C = 36

*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

256. Econo Car offers two plans for one-week rentals of a compact car. A rate of $295 per week includes the first 1,000 kilometres. Extra distance costs 15 cents per kilometre. A weekly rate of $389 allows unlimited driving. Rounded to the nearest kilometre, beyond what driving distance is the unlimited driving plan cheaper?

1,627 km

*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

257. Alicia pays 38% income tax on any additional earnings. She has an opportunity to work overtime at 1.5 times her base wage of $23.50 per hour. Rounded to the nearest quarter hour, how much overtime must she work to earn enough money (after tax) to buy a canoe that costs $2750 including sales taxes?

125¾ hours

*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

258. A firm received a bill from its accountant for $3,310, representing a combined total of 41 "billable" hours for both the Certified General Accountant (CGA) and her accounting technician, for conducting the firm's audit. If the CGA charges her time at $120 per hour and the technician's time at $50 per hour, how many hours did each work on the audit?

CGA: 18 hours; technician: 23 hours

*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

259. Joan, Stella, and Sue have agreed to form a partnership. For the original capital investment of $32,760, Sue agrees to contribute 20% more than Joan, and Joan agrees to contribute 20% more than Stella. How much will each contribute?

Stella = $9,000; Joan = $10,800; Sue = $12,960

*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

260. The annual net income of the SGR partnership is to be distributed so that Sven receives 30% less than George, and Robert receives 25% more than George. If the past year's net income was $88,880, what amount should be allocated to each?

George = $30,128.81; Robert = $37,661.02; Sven = $21,090.17

*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

261. It takes 20 minutes of machine time to manufacture Product X and 30 minutes of machine time to manufacture Product Y. If the machine operated 47 hours last week to produce a combined total of 120 units of the two products, how many units of Y were manufactured?

42

*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

262. The tickets for a hockey game cost $19.00 for the blue LO and $25.50 for the red LO. If 4,460 tickets were sold for a total of $93,450, how many seats were sold in each LO?

blue = 3120; red = 1340

*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

263. Regal Resources owns a 58% interest in a mineral claim. Yukon Explorations owns the remainder. If Regal sells one-fifth of its interest for $1.2 million, what is the implied value of Yukon's interest?

$4,344,828

*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

264. The statistics for a professional accounting program indicate that five-sevenths of those who enter the program complete Level 1. Two-ninths of Level 1 completers do not finish Level 2. If 587 students completed Level 2 last year, how many (including this group of 587) began Level 1?

1,057

*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

265. The profits from a partnership are to be distributed so that Grace receives 20% more than Kajsa, and Mary Anne receives five-eighths as much as Grace. How much should each receive from a total distribution of $36,000?

Kajsa receives $12,203.39; Grace receives $14,644.07; Mary Anne receives $9152.54

*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

266. A hockey arena has 2500 seats in the preferred red LOs near centre ice and 4500 seats in the less desirable blue LOs. At regular season prices, a sell-out would generate ticket revenue of $50,250 for a single game. Ticket prices are raised by 20% in the "blues" and 30% in the "reds" for the playoffs. Ticket revenue from a playoff sell-out would be $62,400. What are the ticket prices for the playoffs?

$10.92 reds; $7.80 blues

*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

267. Rory invested a total of $7,800 in shares of ABC Ltd. and XYZ Inc. One year later the investment was worth $9,310, after the shares of ABC had increased in value by 15% and the shares of XYZ were up 25%. How much did Rory invest in each company?

$3400 invested in XYZ; $4400 invested in ABC

*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

268. Fred has centralized the purchasing and recordkeeping functions for his three pharmacies in a single office. The annual costs of the office are allocated to the three stores. The Hillside store is charged $1,000 less than twice the charge to the Barnett store. The Westside store is charged $2,000 more than the Hillside store. What is the charge to the Westside store if the cost of operating the central office for a year is $27,600?

$12,040

*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

269. Classic Homes has found from experience that there should be 40% as many two-bedroom homes as three-bedroom homes in a subdivision, and twice as many two-bedroom homes as four-bedroom homes. How many homes of each type should Classic build in a new 96-home subdivision?

24 two-bedroom; 60 three-bedroom; 12 four-bedroom

*Difficulty: Difficult*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

270. Broadway Mazda usually spends half as much on radio advertising as on newspaper advertising, and 60% as much on television advertising as on radio advertising. If next year's total advertising budget is $160,000, how much (rounded to the nearest dollar) should be allocated to each form of advertising?

Radio: $44,444; TV: $26,667; Newspaper: $88,889

*Difficulty: Difficult*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

271. A city's commercial construction by-laws require five parking spaces for every 100 square metres of retail rental space in a shopping centre. Four percent of the parking spaces must be large spaces for the physically handicapped. Of the remainder, there must be 40% more regular-size spaces than "small-car" spaces. How many parking spaces of each type are required for a 27,500 square metre shopping centre?

55 handicapped; 550 small-car; 770 regular

*Difficulty: Difficult*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

272. Erin has invested in both an equity mutual fund and a bond mutual fund. Her financial advisor told her that her overall portfolio rose in value by 1.1% last year. Erin noted in the newspaper that the equity fund lost 3.3% last year while the bond fund rose 7.7%. To the nearest 0.1%, what percentage of her portfolio was in the equity fund at the beginning of the year?

60%

*Difficulty: Difficult*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

273. Steel is an alloy of iron and nickel. A steel recycling company has two piles of scrap steel. Pile A contains steel with 5.25% nickel content. Pile B contains steel with 2.84% nickel. The company has an order for 32.5 tonnes of steel containing 4.15% nickel. How much scrap steel should be taken from each pile for reprocessing?

17.67 tonnes from A; 14.83 tonnes from B

*Difficulty: Difficult*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

274. The board of directors of Meditronics Inc. has designated 100,000 stock options for distribution to employees and management of the company. Each of three executives is to receive 2,000 more options than each of eight scientists and engineers. Each scientist and engineer is to receive 50% more options than each of 14 technicians. How many options will a person in each position receive?

Technician: 3,082; Scientist: 4,623; Executive: 6,623

*Difficulty: Difficult*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

275. Quality Grocer makes its own bulk "trail mix" by mixing raisins and peanuts. The wholesale cost of raisins is $3.75 per kg and the cost of peanuts is $2.89 per kg. To the nearest 0.1 kg, what amounts of peanuts and raisins should be mixed to produce 50 kg of trail mix with an effective wholesale cost of $3.20 per kg?

Peanuts: 32.0 kg; Raisins 18.0 kg

*Difficulty: Difficult*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

276. Mr. and Mrs. Chudnowski paid $1,050 to fly with their three children from Winnipeg to Regina. Mrs. Ramsey paid $610 for herself and two children on the same flight. What were the airfares per adult and per child?

$270 adult; $170 child

*Difficulty: Difficult*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

277. Calculate the missing value: Initial Value = $95; Final Value = $100; Percent Change =?

5.26%

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

278. Calculate the missing value: Initial Value = 135kg; Final Value = 35kg; Percent Change =?

-74.07%

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

279. Calculate the missing value: Initial Value = 0.11; Final Value = 0.13; Percent Change =?

18.18%

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

280. Calculate the missing value: Initial Value = 0.095; Final Value = 0.085; Percent Change =?

-10.53%

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

281. Calculate the missing value: Initial Value = $134.39; Final Value =?; Percent Change = -12%

$118.26

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

282. Calculate the missing value: Initial Value = 112g; Final Value =?; Percent Change = 112%

237.44g

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

283. Calculate the missing value: Initial Value =?; Final Value = $75; Percent Change = 200%

$25.00

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

284. Calculate the missing value: Initial Value =?; Final Value = $75; Percent Change = -50%

$150.00

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

285. $100 is what percent more than $90?

11.11%

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

286. $100 is what percent less than $110?

-9.09%

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

287. What amount is 17.5% more than $29.43?

$34.58

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

288. What amount reduced by 80% leaves $100?

$500.00

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

289. What amount reduced by 15% equals $100?

$117.65

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

290. What is $47.50 increased by 320%?

$199.50

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

291. What amount when increased by 25% equals $100?

$80.00

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

292. $75 is 75% more than what amount?

$42.86

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

293. How much is $75 after an increase of 75%?

$131.25

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

294. What amount when decreased by 62% equals $213.56?

$562.00

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

295. What amount when increased by 125% equals $787.50?

$350.00

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

296. What amount is 30% less than $300?

$210.00

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

297. $100 is 10% less than what amount?

$111.11

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

298. What amount after a reduction of 20% equals $100?

$125.00

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

299. How much is $900 after a decrease of 90%?

$90.00

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

300. How much is $10,000 increased by ¾%?

$10,075.00

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

301. What amount after being increased by 210% equals $465?

$150.00

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

302. The total cost of a coat, including HST of 13% on the retail price, was $281.37. What is the retail price of the coat?

$249.00

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

Becker Tools sold 32,400 hammers at an average price of $15.10 in Year 1 and 27,450 hammers at an average price of $15.50 in Year 2. What was the percent change from Year 1 to Year 2 in:

303. The number of hammers sold?

-15.28%

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

304. The average selling price?

2.65%

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

305. The revenue from the sale of hammers?

-13.03%

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

An investor purchased shares of Digger Resources at a price of $0.55 per share. One year later, the shares traded at $1.55, but they fell back to $0.75 by the end of the second year after the date of purchase. Calculate the percent change in the share price:

306. In the first year

181.82%

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

307. In the second year

-51.61%

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

308. Over both years

36.36%

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

309. Mountain Sports is advertising "30% Off All Skiing Equipment" in its Spring Clearance Sale. On ski boots marked down to $348.60, what is the regular price?

$498.00

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

310. The price of the shares of Nadir Explorations Ltd. fell by 76% in the past year, to the current price of $0.45 per share. In dollars and cents, how much did the price of each share drop in the past year?

$1.43

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

311. Two years ago the shares of Diamond Strike Resources traded at a price of $3.40 per share. One year later the shares were at $11.50, but then they declined in value by 35% during the subsequent year. Calculate:

a) The percent change in the share price during the first year.
b) The current share price.

a) 238.24%; b) $7.48

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

312. Barry recently sold some stock after holding it for 2 years. The stock rose 150% in price during the first year but fell 40% in the second year. At what price did he buy the stock if he sold it for $24 per share?

$16.00

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

313. After Island Farms increased the container size for its premium ice cream from 1.65 L to 2.2 L, the retail price increased from $5.49 to $7.98. What was the percent change in the unit price?

9.02%

*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

314. Mutual Fund A charges an annual management fee of 2.38% of money under management. The corresponding management fee for Mutual Fund B is 1.65%. On the same invested amount, what percentage more fees will you pay to Fund A than to Fund B?

44.24%

*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

315. In January of 2008, the federal government reduced the GST rate from 6% to 5%. What was the resulting percent reduction in the dollar amount of GST consumers paid on any item?

-16.7%

*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

316. The owner listed a property for 140% more than she paid for it 12 years ago. After receiving no offers during the first 3 months of market exposure, she dropped the list price by 10%, to $172,800. What was the original price that the owner paid for the property?

$80,000

*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

317. A car dealer normally lists new cars at 22% above cost. A demonstrator model was sold for $17,568 after a 10% reduction from the list price. What amount did the dealer pay for this car?

$16,000

*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

318. If the Canadian dollar is worth 1.5% less than the U.S. dollar, by what percentage does the U.S. dollar exceed the value of the Canadian dollar?

1.52% more than the Canadian dollar

*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-19 Reversing a Percent Difference*

319. Last year, Canada's exports to the U.S. exceeded imports from the U.S. by 9.62%. By what percentage were the United States' exports to Canada less than its imports from Canada?

8.78% less

*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-19 Reversing a Percent Difference*

320. Albion Distributors' revenues and expenses for the fiscal year just completed were $2,347,000 and $2,189,000, respectively.

a) If in the current year revenues rise by 10% but expense increases are held to 5%, what will be the percent increase in operating profit?
b) If, instead, revenues decline by 10% and expenses are reduced by 5%, what will be the percent change in operating profit?

a) 79.27%; b) -79.27%

*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

321. The Hampton District school board decided to reduce the number of students per teacher next year by 15%. If the number of students does not change, by what percentage must the number of teachers be increased?

17.65%

*Difficulty: Difficult*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-19 Reversing a Percent Difference*

322. The Lightning laser printer prints 30% more pages per minute than the Reliable laser printer. What percentage less time than the Reliable will the Lightning require for long print jobs?

23.08% less

*Difficulty: Difficult*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-19 Reversing a Percent Difference*

323. If the euro is worth 32% more than the Canadian dollar, how much less (in percentage terms) is the Canadian dollar worth than the euro?

24.24 % less

*Difficulty: Difficult*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-19 Reversing a Percent Difference*

324. A hospital can increase the dollar amount budgeted for nurses' overtime wages during the next year by only 3%. The nurses union has just won an 11% hourly rate increase for the next year. By what percentage must the hospital cut the number of overtime hours in order to stay within budget?

7.21%

*Difficulty: Difficult*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-19 Reversing a Percent Difference*

325. Simplify: $2a - (-a) + 4a - 5a$

$2a$

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-03 Addition and Subtraction*

326. Simplify and collect like terms: $(7m^3 - m - 6m^2 + 10) - (5m^3 - 9 + 3m - 2m^2)$

$2m^3 - 4m^2 - 4m + 19$

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-03 Addition and Subtraction*

327. Simplify and collect like terms: $2(7x - 3y) - 3(2x - 3y)$

$8x + 3y$

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-03 Addition and Subtraction*

328. Simplify and collect like terms: $4(a^2 - 3a - 4) - 2(5a^2 - a - 6)$

$-6a^2 - 10a - 4$

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-03 Addition and Subtraction*

329. Simplify and collect like terms: $15x - [4 - 2(5x - 6)]$

$25x - 16$

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-03 Addition and Subtraction*

330. Simplify: $-4x - [-3x + 2(x - 6)]$

$-3x + 12$

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-03 Addition and Subtraction*

331. Perform the operation indicated and collect like terms: $(4r - 3t)(2t + 5r)$

$20r^2 - 7rt - 6t^2$

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-04 Multiplication and Division*

332. Perform the operation indicated and collect like terms:

$$\frac{32a^2b - 8ab + 14ab^2}{2ab}$$

16a - 4 + 7b

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-04 Multiplication and Division*

333. Perform the operation indicated and collect like terms: $-(p^2 - 4pq - 5p)$

$$\left(\frac{2q}{p}\right)$$

$-2pq + 8q^2 + 10q$

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-04 Multiplication and Division*

334. Perform the operation indicated and collect like terms:

$$\frac{4a^2b^3 - 6a^3b^2}{2ab^2}$$

$2ab - 3a^2$

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-04 Multiplication and Division*

335. Evaluate and calculate to the cent:

$$\frac{I}{rt}$$

for $r = 0.095$, $I = \$23.21$,

$$t = \frac{283}{365}$$

$315.11

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-05 Substitution*

336. Simplify:

$$\left(\frac{3a^3b^2}{a-b}\right)^4$$

$$\frac{81a^{12}b^8}{(a-b)^4}$$

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

337. Simplify:

$$\left(\frac{3}{2x^2}\right)^2\left(\frac{6x^3}{5^2}\right)\left(-\frac{x}{5}\right)^{-1}$$

$$-\frac{27}{10x^2}$$

*Difficulty: Moderate*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

338. Simplify:

$$\frac{(-2y)^3\left(x^4\right)^{-2}}{\left(x^{-2}\right)^2(4y)^2}$$

$$-\frac{y}{2x^4}$$

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

339. Simplify:

$$P\left(1+0.095\times\frac{135}{365}\right)+\frac{2P}{\left(1+0.095\times\frac{75}{365}\right)}$$

2.996843P

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-03 Addition and Subtraction*

340. Simplify:

$$\frac{(2x^4y^2z^3)^2}{4xyz^2}$$

$x^7y^3z^4$
3.0509P
2.8685y

*Difficulty: Difficult*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-07 Rules and Properties of Exponents*

341. Simplify and collect like terms:

$$k(1+0.04)^2+\frac{2k}{(1+0.04)^2}$$

2.9307k
-2.6243h

*Difficulty: Difficult*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-03 Addition and Subtraction*

342. Simplify the following expression

$$\frac{4x}{2}+\frac{4.02x}{5}-\frac{x}{3}$$

$$\frac{74.12x}{30}$$

or 2.4707x

*Difficulty: Difficult*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-03 Addition and Subtraction*

343. Simplify the following expression

$$\frac{2.8x}{2}-\frac{6.15x}{1.5}-\frac{2x}{2.75}$$

$$-\frac{28.275x}{8.25}$$

or -3.4273x

*Difficulty: Difficult*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-03 Addition and Subtraction*

344. Evaluate the following, given R = 725, I = .076, n = 4

$$\frac{R}{i}\left[1+\frac{1}{(1+\ i)^n}\right]$$

16,656.11

*Difficulty: Difficult*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-05 Substitution*

345. Evaluate: $(1 + i)^m - 1$ for i = 0.0225, m = 4

0.093083

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-05 Substitution*

346. Simplify:

$$\left(-\frac{2x^2}{3}\right)^{-2}\left(\frac{5^2}{6x^3}\right)\left(-\frac{15}{x^5}\right)^{-1}$$

$$-\frac{5}{8x^2}$$

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

347. Evaluate and calculate to the cent: $L(1 - d_1)(1 - d_2)(1 - d_3)$ for $L$ = \$490, $d_1 = 0.125$, $d_2 = 0.15$, $d_3 = 0.05$

\$346.22

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-05 Substitution*

348. Evaluate:

$$R[\frac{(1+i)^n - 1}{i}]$$

for $R$ = \$1,200, $i$ = 0.02, $n$ = 6

\$7,569.745

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-05 Substitution*

349. Simplify:

$$\frac{\left[\left(x^{1/3}\right)\left(x^{2/3}\right)x\right]^{3/2}}{\left(8x^3\right)^{2/3}}$$

$$\frac{x}{4}$$

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

350. Perform operations and gather like terms:

$$\frac{x}{1+0.085\times\frac{63}{365}}+2x\left(1+0.085\times\frac{151}{365}\right)$$

3.05587x

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-03 Addition and Subtraction*

351. Simplify: $x^7 \div x^{-4} \div x^3$

$x^8$

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

352. Evaluate to six-figure accuracy:

$$\frac{1-(1+0.045)^{-12}}{0.045}$$

9.11858

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

353. Evaluate to six-figure accuracy: $7^{3/2}$

18.5203

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

354. Evaluate to six-figure accuracy:

$$\left(4^4\right)\left(3^{-3}\right)\left(-\frac{3}{4}\right)^3$$

-4

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

355. Evaluate to six-figure accuracy:

$$\left(-\frac{2}{3}\right)^3 \div \left(\frac{3}{2}\right)^{-2}$$

-0.666667

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

356. Evaluate to six-figure accuracy:

$$\frac{\left(1.008\overline{3}\right)^{30}-1}{0.008\overline{3}}$$

33.9235

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

357. Simplify:

$$\frac{1-(1+0.015)^{-18}}{0.015}$$

15.67

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

358. Evaluate to six-figure accuracy:

$$\frac{1-\left(1.00\overline{6}\right)^{-32}}{0.00\overline{6}}$$

28.7312

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

359. Evaluate to six-figure accuracy: $(1 + 0.0275)^{1/3}$

1.00908

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

360. Evaluate $(1.15)^{7}\ (1.15)^{-5}$

1.3225

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

361. Evaluate
$\sqrt[3]{2.37}$

1.33

*Difficulty: Easy*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

362. Simplify:

$$\frac{\left(-2a^3\right)^{-2}\left(4b^4\right)^{3/2}}{\left(-2b^3\right)(0.5a)^3}$$

$$-\frac{8b^3}{a^9}$$

$864.28

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

363. Use the formula $V_f = V_i(1 + c_1)(1 + c_2)(1 + c_3)$ to determine $c_2$ if $V_f$ = \$586.64, $V_i$ = \$500, $c_1 = 0.17$, and $c_3 = 0.09$.

-8.00%

*Difficulty: Moderate*
*Learning Objective: 02-02 Rearrange a formula or equation to isolate a particular variable*
*Topic: 02-05 Substitution*
*Topic: 02-06 Manipulating Equations and Formulas*

364. Simplify the following equation

$$\frac{15r^7t^9}{(3r^3t)^5}$$

$$\frac{5t^4}{81r^8}$$

*Difficulty: Moderate*
*Learning Objective: 02-01 Simplify algebraic expressions by extracting common factors and applying rules of exponents*
*Topic: 02-07 Rules and Properties of Exponents*

365. Solve for the unknown variable: 3(x - 6) + 5x - 2(2x - 3) = 0

$x = 3$

*Difficulty: Easy*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-09 Solving a Linear Equation in One Unknown*

366. Solve for the unknown variable: 9x + 10 = -3x + 34

$x = 2$

*Difficulty: Easy*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-09 Solving a Linear Equation in One Unknown*

367. Solve: $3.1t + 145 = 10 + 7.6t$

t = 30

*Difficulty: Easy*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-09 Solving a Linear Equation in One Unknown*

368. Solve: $1.25y - 20.5 = 0.5y - 11.5$

y = 12

*Difficulty: Easy*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-09 Solving a Linear Equation in One Unknown*

369. Solve the following pair of equations:

$2x + 7y = -8$
$5x - 2y = 19$

$x = 3; y = -2$

*Difficulty: Easy*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-10 Solving Two Linear Equations in Two Unknowns*

370. Solve for the following pair of equations to three figure accuracy.

$x - y = 12$
$4x + 6y = 42$

$x = 11.4\ y = -0.6$

*Difficulty: Moderate*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-10 Solving Two Linear Equations in Two Unknowns*

371. Solve the following pair of equations. Verify your solution. $4a - 3b = -3\ 5a - b = 10$

$a = 3, b = 5$

*Difficulty: Easy*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-10 Solving Two Linear Equations in Two Unknowns*

372. Solve for the unknown variable: $1.5a + 3(4a - 6) = a(1.5)^2$

$a = 1.6$

*Difficulty: Moderate*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-09 Solving a Linear Equation in One Unknown*

373. Evaluate the following:

$0.07x + 0.38y = 0.294$
$-0.3x + 0.7y = 0.37$

$x = 0.4$; $y = 0.7$

*Difficulty: Moderate*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-10 Solving Two Linear Equations in Two Unknowns*

374. Solve the following pair of equations. Verify your solution. $g - h = 17$

$$\frac{4}{3}g + \frac{3}{2}h = 0$$

(9, -8)

*Difficulty: Moderate*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-10 Solving Two Linear Equations in Two Unknowns*

375. Solve the following pair of equations. Verify your solution. $0.33e + 1.67f = 292$ $1.2e + 0.61f = 377$

(250.45, 125.36)

*Difficulty: Moderate*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-10 Solving Two Linear Equations in Two Unknowns*

376. Solve the following pair of equations. Verify your solution. $318j - 451k = 7.22$ $-249j + 193k = -18.79$

(0.139, 0.0820)

*Difficulty: Moderate*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-10 Solving Two Linear Equations in Two Unknowns*

377. Solve for the following pair of equations to three figure accuracy

2.8a + 6.9n = 93.4
4.6a + 12.5b = 155.6

a = 28.791; b= 1.853

*Difficulty: Moderate*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-10 Solving Two Linear Equations in Two Unknowns*

378. Solve for the following pair of equations to three figure accuracy

10.6x + 8.2y = 16.2
8.5x + 11.7y = 34.8

x = -1.764; y = 4.256

*Difficulty: Moderate*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-10 Solving Two Linear Equations in Two Unknowns*

379. Solve for the following pair of equations to three figure accuracy

2.9y + 6.8z = 185.8
6.4y + 10.1z = 149.3

y = -60.53; z = 53.138

*Difficulty: Moderate*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-10 Solving Two Linear Equations in Two Unknowns*

380. Solve the following pair of equations.

2y = 5x
3y - 5x = 0

*x* = 0; *y* = 0

*Difficulty: Difficult*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-10 Solving Two Linear Equations in Two Unknowns*

381. Solve for the unknown variable:

$$\frac{x}{(1.02)^6} + 3x(1.02)^4 - \$1000 = \frac{\$4000}{(1.02)^3}$$

$1,153.32

*Difficulty: Difficult*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-09 Solving a Linear Equation in One Unknown*

382. Solve accurate to the cent:

$$\frac{x}{1+0.115\times\frac{78}{365}} + 3x\left(1+0.115\times\frac{121}{365}\right) = \$1000\left(1+0.115\times\frac{43}{365}\right)$$

x = $247.79

*Difficulty: Difficult*
*Learning Objective: 02-03 Solve a linear equation in one variable, and two linear equations in two variables*
*Topic: 02-09 Solving a Linear Equation in One Unknown*

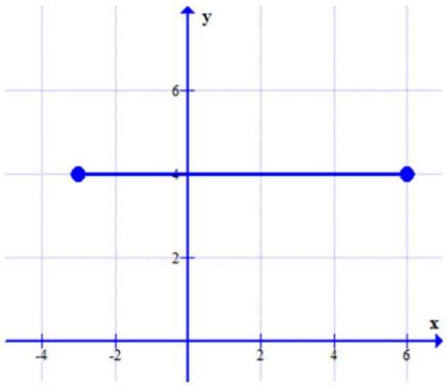
383. Graph following equation: -2*x* + *y* = 4 over the range *x* = -3 to *x* = 6

(-3, -2), (0, 4), (6, 16)

*Difficulty: Easy*
*Learning Objective: 02-04 Graph a linear equation in two variables*
*Topic: 02-12 Graphing a Linear Equation in Two Unknowns*

384. Graph following equation: $y = 4$ over the range $x = -3$ to $x = 6$

(-3, 4), (0, 4), (6, 4)




*Difficulty: Easy*
*Learning Objective: 02-04 Graph a linear equation in two variables*
*Topic: 02-12 Graphing a Linear Equation in Two Unknowns*

385. Determine the slope and *y*-intercept of each of the following equations.

a) $2b + 3 = 5a$
b) $3a - 4b = 12$
c) $0 = 2400 - 4a - 5b$
d) $7a = -89b$

a) slope = 5/2; intercept = -3/2; b) slope = 3/4; intercept = -3; c) slope = -4/5; intercept = 480; d) slope = -7/8; intercept = 0

*Difficulty: Easy*
*Learning Objective: 02-05 Express a linear equation in slope-intercept form*
*Topic: 02-13 The Slope-Intercept Form of a Linear Equation*

386. Gamma Corp. manufactures and sells widgets for $6.00 each. Therefore, its total revenue, *TR*, from the sale of *X* widgets in a year is $TR = \$6X$

It costs Gamma $2 for materials and labour to produce each widget. In addition, Gamma expects to incur $80,000 of other costs during a year. Therefore, Gamma's total costs for the year, *TC*, are expected to be
$-720TC = \$2X + \$80,000$
Gamma's expected net income, *NI*, for the year will be
$NI = TR - TC$
$= \$6X - (\$2X + \$80,000)$
$= \$4X - \$80,000$

a) What is the slope and *TR*-intercept of a *TR* vs. *X* plot?
b) What is the slope and *TC*-intercept of a *TC* vs. *X* plot?
c) What is the slope and *NI*-intercept of an *NI* vs. *X* plot?
d) Which of the three plotted lines is steepest?
e) How much does *NI* increase for each widget sold?
f) If Gamma were able to reduce its materials and labour cost to $1.75 per widget, state for each plotted line whether its slope would increase, decrease, or remain unchanged.

a) Slope = $6; intercept = $0; b) slope = $2; intercept = $80,000; c) slope = $4; intercept = -$80,000; d) TR line is steepest; e) $4; f) slope of TR vs. X stays same; slope of TC vs. X decreases; slope of NI vs. X increases.

*Difficulty: Easy*
*Learning Objective: 02-05 Express a linear equation in slope-intercept form*
*Topic: 02-13 The Slope-Intercept Form of a Linear Equation*

387. Solve the following set of equations graphically:

$2x + 3y = 12$
$x - y = 1$

$x = 3; y = 2$
$x = 1; y = 6$

*Difficulty: Easy*
*Learning Objective: 02-06 Solve two equations in two unknowns by a graphical method*
*Topic: 02-14 Solving Two Equations in Two Unknowns Graphically*

388. Solve the following set of equations graphically:

3x - 3y = -15
-x + y = 5

*x* = -2, *y* = -5

*Difficulty: Moderate*
*Learning Objective: 02-06 Solve two equations in two unknowns by a graphical method*
*Topic: 02-14 Solving Two Equations in Two Unknowns Graphically*

389. Solve the following set of equations graphically:

y = 2x + 11
5x + 3y = 0

*x* = -3; *y* = 5

*Difficulty: Moderate*
*Learning Objective: 02-06 Solve two equations in two unknowns by a graphical method*
*Topic: 02-14 Solving Two Equations in Two Unknowns Graphically*

390. Solve the following set of equations graphically:

x = -y - 4
y = -5x - 4

*x* = 0; *y* = -4

*Difficulty: Moderate*
*Learning Objective: 02-06 Solve two equations in two unknowns by a graphical method*
*Topic: 02-14 Solving Two Equations in Two Unknowns Graphically*

391. Solve the following set of equations graphically:

$3x - 2y = 9$
$x = 3$

$x = 3; y = 0$

*Difficulty: Moderate*
*Learning Objective: 02-06 Solve two equations in two unknowns by a graphical method*
*Topic: 02-14 Solving Two Equations in Two Unknowns Graphically*

392. Solve the following set of equations graphically:

$4x + 3y = -2$
$y = -2$

$x = 1; y = -2$

*Difficulty: Moderate*
*Learning Objective: 02-06 Solve two equations in two unknowns by a graphical method*
*Topic: 02-14 Solving Two Equations in Two Unknowns Graphically*

393. Marika bought 5 litres of milk and 4 dozen eggs for $13.97. Lester purchased 9 litres of milk and 3 dozen eggs for $16.83. What were the prices for a litre of milk and a dozen eggs?

$1.21 per litre and $1.98 per dozen

*Difficulty: Easy*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

394. TinyTot School purchases the same amount of milk and orange juice each week. After price increases from $1.10 to $1.15 per litre of milk and from $0.98 to $1.14 per can of frozen orange juice, the weekly bill rose from $42.20 to $45.85. How many litres of milk and cans of orange juice are purchased every week?

25 litres of milk and 15 cans of OJ

*Difficulty: Easy*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

395. Larissa works in a retail store in Square One in Mississauga. She earns a base salary of $320 per week, and a commission of 3% on sales over her quota of $5,000. If Larissa earned $515 last week, what was the value of her sales?

$11,500

*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

396. During a one-day special, a grocery store sells cucumbers at 98 cents each or four for the price of three. At the end of the day, the store's computer reports that revenue from the sale of 541 cucumbers was $418.46. How many cucumbers were sold on the four-for-three promotion?

456

*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

397. Tickets for the end of semester dance sold for $10 if purchased in advance, and $15 if purchased at the door. If 392 tickets were sold for a total of $4280, how many tickets were sold at the door?

72

*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

398. Sam earns $17.00 per hour for a forty-hour week. His overtime rate is 1 ½ times any hours exceeding forty in a week. If Sam earned $807.50 last week, how many overtime hours did he work?

5

*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

399. Bart purchased 60% of a three-eighths interest in a ski chalet for $25,000. What was the implied value of the chalet?

$111,111.11

*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

400. Mrs. Simone invested $20,000 in two investments paying 2% and 3% respectively. She earned $460 interest for the year. How much did Mrs. Simone invest at 3%?

$6,000

*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

401. Executive Fashions sold four-sevenths of its inventory at cost in a bankruptcy sale. The remainder was sold to liquidators for $6,700 representing 45% of the cost of the goods.

a) What was the original cost of the inventory that was sold to the liquidators?
b) What were the proceeds from the bankruptcy sale?

a) $14,888.89; b) $19,852

*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

402. Kristina is in charge of billing for a company that does computer training. She is preparing an invoice for $1,340 for 32 hours of work, which includes training at $70 per hour and preparation of a manual at $25 per hour. How many hours of training are included in the invoice?

12

*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

403. As a fundraiser, a local charity sold raffle tickets on a trip to Disney World at $2 each or three for $5. In all, 3,884 tickets were sold for a total of $6,925. How many people bought tickets at the three for $5 discount?

843 people

*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

404. A convenience store sells canned soft drinks at $4.35 for a six-pack or 90 cents for a single can. If revenue from the sale of 225 cans of soft drinks on a weekend was $178.35, how many six-packs and how many single cans were sold?

23 six-packs and 87 single cans

*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

405. A manufacturing firm pays monthly salaries of $3,400 to each production worker and $2,800 to each assembly worker. As the economy drops into a recession, the firm decides to reduce its total monthly manufacturing payroll from $253,800 to $198,000 by laying off 20% of its production workers and 25% of its assembly workers. How many layoffs will there be from each of the assembly and production divisions?

9 production workers and 9 assembly workers will be laid off

*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

406. The annual net income of the Todd Bros. partnership is distributed so that Ken receives $15,000 more than 80% of Hugh's share. How should a net income of $98,430 be divided between the partners?

Hugh = $46,350 and Ken = $52,080

*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

407. The Canucks charge $150 for Premium Tickets and $80 for Standard Tickets. If 18,500 tickets were sold for the Montreal game and $2,215,000 in revenues were recorded, how many Premium and Standard tickets were sold?

Premium = 10,500 seats and Standard = 8,000 seats.

*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

408. $100,000 is to be distributed under a firm's profit-sharing plan. Each of 3 managers is to receive 20% more than each of 26 production workers. How much will each manager and production worker receive?

Each worker = $3,378.38; each manager = $4,054.05

*Difficulty: Moderate*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

409. David's portfolio consists of bonds and equity. The bond market rose by 2.5%, while the equity market dropped by 10.5%. David's portfolio increased by 1.25%. What portion of bonds and equity did he have in his portfolio?

Bonds = 90.38% Equity = 9.62%

*Difficulty: Difficult*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

410. Granola king wishes to mix raisins and granola together to create a cereal. Raisins are priced at $7.25 per Kg while granola is priced at $5.60. If the cereal is to be priced at $6.85 per Kg, then what is the appropriate mix of raisins and granola?

Raisins = .7622 Kg Granola = .2378 Kg

*Difficulty: Difficult*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

411. $1.5 million in bonus will be distributed to employees. Regular employees will each get an equal amount. Middle managers will get 2.5 times the regular employees bonus, while the executives get 5 times the bonus of middle managers. There are forty middle managers, 350 employees and 15 executives. Determine the bonus for regular employees, middle managers and executives.

Regular = $2,352.94 Middle Managers = $5,882.35 and Executives = $29,411.75

*Difficulty: Difficult*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

412. José works in a toy manufacturing plant. The wooden toy he fabricates requires three steps: cutting, assembly, and painting. Assembly takes two minutes longer than half the cutting time, and painting requires half a minute longer than half the assembly time. How long does each step require if José made 72 units in 42 hours of work?

Cutting = 18 minutes; Assembly = 11 minutes; Painting = 6 minutes

*Difficulty: Difficult*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

413. Dash Canada offers two long-distance telephone plans. Plan X costs 13 cents per minute for calls between 8 a.m. and 6 p.m. weekdays (business hours) and 9 cents per minute at other times. Plan Y costs 10.6 cents per minute any time. Above what percentage of business-hour usage will Plan Y be cheaper?

40%

*Difficulty: Difficult*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

414. The Hungry Heifer diner offers an all-you-can-eat buffet at $12.95 per adult and $8.95 per child. On a particular day, the diner had total buffet revenue of $3,304.70 from 266 customers. How many of the customers were children?

35

*Difficulty: Difficult*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

415. Tina drove from Calgary to Vancouver, a distance of 1,000 km, in 12.3 hours. She drove at 100 km/h on the "open road," but slowed to 50 km/h on urban and curving roads. What distance did she drive at each speed? (Hint: Travelling time at a particular speed is Distance/Speed)

230 km at 50 km/h; 770 km at 100 km/h

*Difficulty: Difficult*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

416. Economy Truck Rentals offers short-term truck rentals consisting of an hourly rate plus a per-kilometre charge. Victor paid $39.81 for a two-hour rental during which he drove 47 km. Boyce paid $93.89 for five hours and 93 km driven. What rate did Budget charge per hour and per km?

$14.50 per hour plus $0.23 per km

*Difficulty: Difficult*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

417. Shirley had a three-sevenths interest in a partnership. She sold three-fifths of her interest for $27,000.

a) What is the implied value of Shirley's remaining partnership interest?
b) What is the implied value of the entire partnership?

a) $18,000; b) $105,000

*Difficulty: Difficult*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

418. Buckerfields Garden Supply makes custom fertilizer by mixing appropriate combinations of bulk 6% nitrogen fertilizer with bulk 22% nitrogen fertilizer. How many kilograms of each type should be mixed to make 300 kg of 16% nitrogen fertilizer? (Hint: The weight of nitrogen in the mixture equals the total weight of nitrogen in the two components mixed together.)

112.5 kg of 6% fertilizer; 187.5 kg of 22% fertilizer

*Difficulty: Difficult*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

419. Colby inherited a small savings-bond portfolio consisting of four $1,000 face-value Canada Savings Bonds and six $1,000 face-value Ontario Savings Bonds. In the first year, the portfolio earned $438 interest. At the end of the first year, Colby cashed in one of the Canada Savings Bonds and two of the Ontario Savings Bonds. In the following year, the remaining bonds earned $306 interest. What annual rate of interest did each type of bond earn?

CSB: 4.2%; OSB: 4.5%

*Difficulty: Difficult*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

420. Mr. LeClair and Ms. Bartoli own adjacent hobby farms. They have just received their property tax bills for the current year. Mr. LeClair's property tax is $1,935 on a residence assessed at $200,000 and land with farm buildings assessed at $150,000. Ms. Bartoli's tax is $1,887 on her residence assessed at $175,000 and land with farm buildings assessed at $190,000. The regional government applies one tax rate to residences, and a lower tax rate to land with farm buildings. What are these property tax rates (expressed in percent to the nearest 0.01%)?

0.72% on residences; 0.33% on land with buildings

*Difficulty: Difficult*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

421. A partnership in a public accounting practice has 7 partners and 12 accounting technicians. Each partner draws the same salary, and each technician is paid the same salary. The partners calculate that if they give the technicians a raise of 5% and if they increase their own salaries by 5%, the gross annual salaries for all accounting personnel will rise from the current $1,629,000 to $1,734,750. What are the current annual salaries of a partner and an accounting technician?

partner salary is $117,000 and the technician salary is $67,500

*Difficulty: Difficult*
*Learning Objective: 02-07 Solve "word problems" that lead to a linear equation in one unknown, or two linear equations in two unknowns*
*Topic: 02-15 Solving Word Problems*

422. Calculate the missing value: Initial Value = $100; Final Value = $95; Percent Change =?

-5.00%

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

423. Calculate the missing value: Initial Value = 35kg; Final Value = 135kg; Percent Change =?

285.71%

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

424. Calculate the missing value: Initial Value = 26.3cm; Final Value =?; Percent Change = 300%

105.2cm

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

425. Calculate the missing value: Initial Value = 0.043; Final Value =?; Percent Change = -30%

0.0301

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

426. What sum of money when increased by 7% equals $52.43?

$49.00

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

427. How much is $56 increased by 65%?

$92.40

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

428. $754.30 is what percent less than $759.00?

-0.62%

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

429. 77,787 is what percent more than 77,400?

0.50%

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

430. What amount after a reduction of 25% equals $50?

$66.67

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

431. What amount after a reduction of
$16.\overline{6}\ \%$
equals $549?

$658.80

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

432. How much is $102 after a decrease of 2%?

$99.96

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

433. How much is $102 after a decrease of 100%?

$0.00

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

434. $750 is what percent more than $250?

200.00%

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

435. $250 is what percent less than $750?

-66.67%

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

436. How much is $1045 decreased by 0.5%?

$1039.78

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

437. What amount when increased by 150% equals $575?

$230.00

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

438. How much is $150 after an increase of 150%?

$375.00

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

439. How much is $10 after an increase of 900%?

$100.00

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

440. On the purchase of a plasma TV, the total cost to the customer (including 13 % HST ) came to $2,822.74. How much HST did the customer pay?

$324.74

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

441. Goldfield Resources' share price fell by $4 in Year 1 and then rose by $4 in Year 2. If the share price was $6 at the end of Year 1, what was the percent change in share price each year?

Year 1: -40.0%; Year 2: 66.67%

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

442. A wholesaler sells to retailers at a 27% discount from the suggested retail price. What is the suggested retail price of an item that costs the retailer $100?

$136.99

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

443. Dawson Mining sold 34,300 oz. of gold in Year 1 at an average price of $320 per ounce. Production was down to 23,750 oz. in Year 2 because of a strike of the miners, but the average price obtained was $360 per ounce. What was the percent change from Year 1 to Year 2 in:

a) The amount of gold produced?
b) The average selling price per ounce?
c) The revenue from the sale of gold?

a) -30.76%; b) 10.34%; c) -23.60%

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

444. The Markham Real Estate Board reports that the average selling price of homes last month in the Markham area was $338,500, an increase of 8.7% over the past year. Rounded to the nearest $100, what was the average selling price one year ago?

$311,400

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

445. For the third quarter of 2016, Google Inc. reported a net income of $381.2 million, up 96% from a year earlier. What was the dollar amount of the increase in net income over the third quarter of 2015?

$186.7 million

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

446. During the past 15 years the price of milk has increased by 160%. If the price is now $1.30 per litre, what is the dollar amount of the price increase per litre?

$0.80 per litre

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

447. A piece of machinery has depreciated by 55% of its original purchase price during the past 4 years, to the current value of $24,300. What is the dollar amount of the total depreciation during the last 4 years?

$29,700

*Difficulty: Easy*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

448. Marilyn bought a stock for $80 last week. Yesterday, the stock went up by 20%. Today it dropped by 20%. What is the current value of the stock?

$76.80

*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

449. What was the percent change in unit price when the regular size of Lily soap bars dropped from 100 g to 90 g (with no change in the price per bar)?

11.11% decrease

*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

450. In 2016, Canada's population reached 32,500,000, a level that was 9.53% higher than ten years earlier. Rounded to the nearest 10,000, what was the population figure for 2006?

29,670,000

*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

451. Cliff just received a raise to $18.45 per hour from $18.00. What is the percent increase in his hourly rate?

2.5%

*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

452. If the CPI increases from 120.0 to 125.0 over a period, what is the percent increase in the CPI?

4.17%

*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

453. General Paint and Cloverdale Paint normally offer the same prices. For its Spring Specials Sale, General Paint has marked down the price of outdoor latex paint by 30%. What percentage more will you pay if you buy paint at the regular price at Cloverdale?

42.86% more at Cloverdale

*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-19 Reversing a Percent Difference*

454. A company has 50% less equity financing than debt financing. What percentage is the debt of the equity? What percentage more debt financing does the company have than equity financing?

2:1 Debt to Equity ratio; therefore, 100%

*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-19 Reversing a Percent Difference*

455. Sales have increased by 10% over last year. What percentage less was last year's sales than this year's sales?

9.09%

*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-19 Reversing a Percent Difference*

456. Fluffy laundry detergent reduced its regular size from 3.6 kg to 3 kg. The retail price dropped from $7.98 to $6.98. What was the percent change in the unit price?

4.96% increase

*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

457. The retail price of All Natural Granola dropped from $7.98 to $7.29 when the package size was reduced from 700 g to 600 g. What was the percent change in the unit price?

6.58%

*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

458. Sears reported that its sales in January were down 17.4% from its sales in December. What percentage were December sales of January sales?

121.07%

*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-19 Reversing a Percent Difference*

459. If operating expenses are 40% of revenue, by what percentage does revenue exceed operating expenses?

150%

*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-19 Reversing a Percent Difference*

460. Future Shop's Toronto store sales increased by 3.45% from last year's sales of $2.5 million. Determine the current year's sales.

$2,586,250

*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

461. In 1985 a 100 gram chocolate cost $0.50. The same chocolate now has decreased to 80 grams and costs $1.75. Calculate the percentage change in grams.

337.5% increase in cost per gram

*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-17 Application: Percent Change*

462. The Euro is 8% greater than the US Dollar. By what percentage is the US Dollar less than the Euro?

7.4%

*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-19 Reversing a Percent Difference*

463. Canadian Exports to China exceeded imports by 12%. By what percentage where Chinese Exports to Canada less than imports from Canada?

18.70%

*Difficulty: Moderate*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-19 Reversing a Percent Difference*

464. Elegance shampoo has a suggested retail price of $4.49 for its 500 ml bottle. The manufacturer of the shampoo wants to increase the unit retail price by 10% at the same time that it reduces the container size to 425 ml. What should be the suggested retail price of the smaller bottle?

$4.20

*Difficulty: Difficult*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

465. The manufacturer of Caramalt chocolate bars wants to implement a 7.5% increase in the unit retail price along with a reduction in the bar size from 100 g to 80 g. If the current retail price of a 100-g bar is $1.15, what should be the price of an 80-g bar?

$0.99

*Difficulty: Difficult*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-18 Calculating Vi or Vf When C is Known*

466. Madison found a sweater at a suburban discount mall for 25% less than at a store in downtown Toronto. What percentage more would she have paid if she bought the sweater in downtown Toronto?

33.3%

*Difficulty: Difficult*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-19 Reversing a Percent Difference*

467. If December sales were 30% more than November sales, by what percent are November sales less than December sales?

23.1%

*Difficulty: Difficult*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-19 Reversing a Percent Difference*

468. If operating expenses are 25% of revenue, by what percentage does revenue exceed operating expenses?

300%

*Difficulty: Difficult*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-19 Reversing a Percent Difference*

469. Bill can do a task 35% faster than John. What percentage less time than John does Bill take to do a task?

25.9%

*Difficulty: Difficult*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-19 Reversing a Percent Difference*

470. If the denominator of a fraction decreases by 20% and the numerator remains unchanged, by what percentage does the value of the fraction change?

25.0% increase

*Difficulty: Difficult*
*Learning Objective: 02-08 Solve problems involving percent change*
*Topic: 02-19 Reversing a Percent Difference*