

**FINAL REVIEW WORKSHEET
INTERMEDIATE ALGEBRA**

Chapter 1.

1. Evaluate $(y - 1)^2$ for $y = -6$.

- (A) -7 (B) 49 (C) 25 (D) -49

2. Translate to an algebraic expression: Five more than nine times some number.

- (A) $5 + 9x$ (B) $5 - 9x$ (C) $5x + 9$ (D) $9x - 5$

3. Which of the following numbers is irrational? $\{-9, \sqrt{25}, \frac{9}{7}, \sqrt{8}, 235\}$

- (A) -9 (B) $\sqrt{25}$ (C) $\frac{9}{7}$ (D) $\sqrt{8}$

4. Simplify: $4 \div (-2) \cdot 2 + 3 \cdot (-4)$

- (A) 4 (B) -4 (C) -16 (D) 16

5. Divide: $\frac{9}{10} \div (-\frac{3}{7})$

- (A) $-\frac{3}{7}$ (B) $-\frac{3}{70}$ (C) -7 (D) $-\frac{21}{10}$

6. Use the commutative law of addition to write an expression equivalent to $2x + 7y$

- (A) $7y - 2x$ (B) $9x + y$ (C) $14xy$ (D) $7y + 2x$

7. Use the associative law of multiplication to write an expression equivalent to $(7x)y$

- (A) $7(xy)$ (B) $y + 7x$ (C) $7x + y$ (D) $y(7x)$

8. Solve the equation: $4(y - 5) = -2(y + 2)$

- (A) $y = -12$ (B) $y = 12$ (C) $y = \frac{3}{8}$ (D) $y = \frac{8}{3}$

9. Solve the equation: $3x - 15 = 2(2x - 5)$

- (A) $x = 5$ (B) $x = -5$ (C) $x = \frac{25}{7}$ (D) $x = -\frac{25}{7}$

10. Mani pays \$135.45 for a new bike. If the price paid includes a 7.5% sales tax, which is the price of the bike itself?

- (A) \$119.50 (B) \$122.80 (C) \$123.00 (D) \$126.00

11. Solve the formula for the specified variable. $V = \frac{1}{3}Bh$ for h .

- (A) $h = \frac{V}{3B}$ (B) $h = \frac{3B}{V}$ (C) $h = \frac{3V}{B}$ (D) $h = \frac{B}{3V}$

12. Simplify. $\frac{m^5n^7}{m^2n^2}$

- (A) m^3n^4 (B) m^3n^5 (C) m^7n^9 (D) $(mn)^8$

13. Simplify. $(-2)^4$

- (A) 16 (B) -8 (C) -16 (D) $\frac{1}{16}$

14. Write an equivalent expression without a negative exponent: x^4y^{-3}

- (A) $\frac{1}{(xy)^{12}}$ (B) $\frac{1}{x^4y^3}$ (C) $-3x^4y$ (D) $\frac{x^4}{y^3}$

15. Simplify. $(-15x^{-1}y^{-8})(-6x^{-3}y^2)$

- (A) $\frac{-21}{x^4y^6}$ (B) $\frac{90}{x^4y^6}$ (C) $\frac{21x^2}{y^6}$ (D) $\frac{90x^3}{y^{16}}$

16. Simplify. $\frac{2.7 \times 10^{-2}}{3.6 \times 10^{-9}}$

- (A) 1.3×10^7 (B) 7.5×10^6 (C) 7.5×10^7 (D) 1.3×10^{-11}

Chapter 2.

17. Which of the following is a solution of $5x - y = 8$.

- (A) $(3, -7)$ (B) $(2, -2)$ (C) $(1, -3)$ (D) $(-1, 13)$

18. Use Figure (1) to graph the following equation: $y = -5x + 2$.

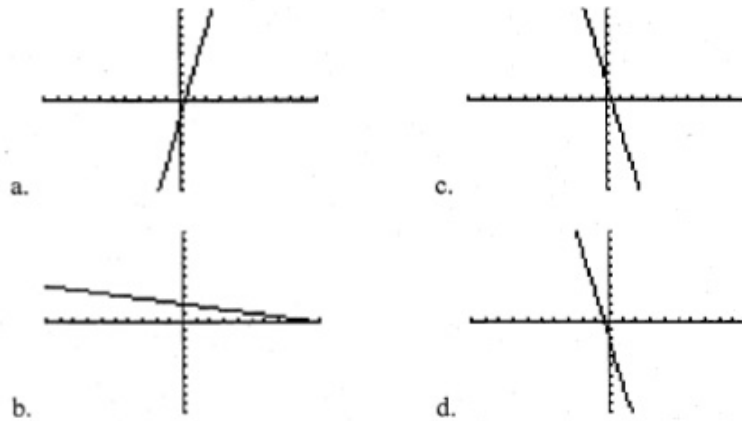


FIGURE 1

19. Use Figure (2) for the graph of f , to determine the following

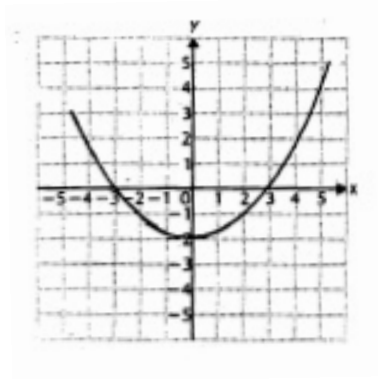


FIGURE 2

- a. $f(4)$
- b. the domain of f
- c. any x values for which $f(x) = -1$
- d. the range of f

20. Use function notation to write an equation for the line containing $(3, -4)$ and $(4, -1)$.

- (A) $f(x) = 4x - 17$ (B) $f(x) = 3x - 13$
 (C) $f(x) = 2x - 10$ (D) $f(x) = x - 7$

Consider $g(x) = -4x + 1$ and $h(x) = x^2 - 6$ for the next three problems.

21. Find $h(-3)$

- (A) -15 (B) -12 (C) -54 (D) 3

22. Find $(g \cdot h)(4)$

- (A) -30 (B) -150 (C) -90 (D) -120

23. Find $h(x + 2)$

- (A) $x^2 - 4$ (B) $x^2 - 2$ (C) $x^2 + 4x - 2$ (D) $-4x - 7$

24. Find the slope of the line that passes through the points $(5, -8)$ and $(8, 4)$.

- (A) $m = 3$ (B) $m = 4$ (C) $m = 12$ (D) $m = -3$

25. Find the slope of the given line $2x - 3y = 12$.

- (A) $m = \frac{3}{2}$ (B) $m = -\frac{3}{2}$ (C) $m = -\frac{2}{3}$ (D) $m = \frac{2}{3}$

26. Find a linear function whose graph has slope 7 and y -intercept $(0, -9)$.

- (A) $f(x) = 7x - 9$ (B) $f(x) = -7x + 9$
 (C) $f(x) = -\frac{7}{9}x + 9$ (D) $f(x) = -\frac{9}{7}x$

27. Which of the following is a linear equation?

- (A) $\frac{x}{y} = 2y$ (B) $2x - \frac{3}{y} = 9$ (C) $8x + 3 = 0$ (D) $5a + 2b^2 = 4$

28. Use Figure (3) to graph the equation $x + 1 = -3$.

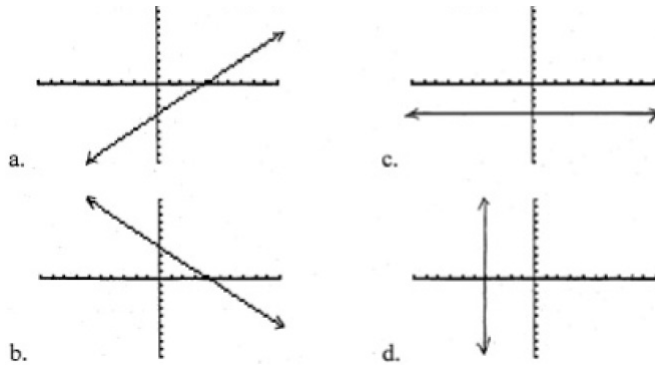


FIGURE 3

29. Find an equation in point-slope form of the line with slope -5 and containing $(3, 2)$.

(A) $y - 3 = -5(x - 2)$ (B) $y - 2 = -5(x - 3)$

(C) $y + 2 = -5(x + 3)$ (D) $y + 3 = -5(x + 2)$

30. Decide if the pairs of lines given are parallel, perpendicular or neither.

$$12x + 4y = 16$$

$$15x + 5y = 23$$

(A) Perpendicular (B) Parallel (C) Neither

31. Find an equation of the line containing $(5, 1)$ and parallel to the line $5x - 3y = 4$.

(A) $y = \frac{5}{3}x - \frac{22}{3}$ (B) $y = \frac{5}{3}x - \frac{28}{3}$ (C) $y = -\frac{3}{5}x - \frac{23}{3}$ (D) $y = -\frac{3}{5}x + 4$

32. Find an equation of the line containing $(5, 1)$ and perpendicular to the line $5x - 3y = 4$.

(A) $y = -\frac{3}{5}x + 4$ (B) $y = -\frac{3}{5}x - \frac{22}{3}$ (C) $y = \frac{5}{3}x - \frac{22}{3}$ (D) $y = \frac{5}{3}x + \frac{17}{3}$

33. Given that $f(x) = 3x^2 - 2x + 5$ and $g(x) = 3x - 1$, find $(g + f)(x)$.

(A) $9x^2 - 6x + 14$ (B) $9x^3 - 9x^2 + 17x - 5$ (C) $3x^2 + x + 4$ (D) $9x^2 + 6x - 16$

34. What is the domain of this function: $f(x) = \frac{3-x}{x+5}$

(A) $(-\infty, -5) \cup (3, \infty)$ (B) $x \neq -5, x \neq 3$ (C) $x \neq -5$ (D) $(-5, 3)$

Chapter 3.**35.** *Solve.*

$$3x + y = -2$$

$$x - 2y = -10$$

- (A) (2, -8) (B) (1, 5) (C) (-2, 4) (D) (-1, 1)

36. *In one day, Tees Inc. sold 376 T-shirts. Plain ones sold for \$14.50 each striped one for \$19.00 each. The company took in \$6469. How many striped shirts were sold?*

- (A) 150 (B) 170 (C) 206 (D) 226

37. *Solve the following system.*

$$2x - y + 3z = 11$$

$$x + 3y + z = 10$$

$$3x - 2y + 4z = 13$$

- (A) (1, -2, 3) (B) (-1, 2, 5) (C) (-1, -2, 2) (D) (5, -1, 0)

38. *Find the equilibrium point for the demand and supply functions $D(p) = 85 - 3p$ and $S(p) = 35 + 2p$.*

- (A) (\$5, 70) (B) (\$7, 49) (C) (\$10, 55) (D) (\$12, 59)

Chapter 4.**39.** *Solve: $7a + 6 \geq 2a - 9$*

- (A) $\{a | a \geq -\frac{1}{3}\}$ (B) $\{a | a \leq -\frac{1}{3}\}$ (C) $\{a | a \leq -3\}$ (D) $\{a | a \geq -3\}$

40. *Find the union: $\{2, 3, 9, 15, 21\} \cup \{3, 6, 9, 12, 15\}$*

- (A) $\{3, 9, 15\}$ (B) $\{2, 21\}$ (C) $\{2, 3, 9, 15\}$ (D) $\{2, 3, 6, 9, 12, 15, 21\}$

41. Solve: $-5 \leq -4x + 7 \leq 1$

(A) $\{x | \frac{3}{2} \leq x \leq 3\}$ (B) $\{x | -2 \leq x \leq \frac{1}{2}\}$

(C) $\{x | -\frac{1}{2} \leq x \leq 2\}$ (D) $\{x | -3 \leq x \leq \frac{3}{2}\}$

42. Solve: $|3m - 1| = 6$

(A) $\frac{7}{3}$ (B) $-\frac{7}{3}, \frac{7}{3}$ (C) $-\frac{5}{3}, \frac{7}{3}$ (D) $-\frac{5}{3}$

43. Solve: $|-3x + 5| \geq 2$

(A) $(-\infty, -\frac{7}{3}] \cup [1, \infty)$ (B) $(-\infty, 1] \cup [\frac{7}{3}, \infty)$ (C) $[-\frac{7}{3}, 1]$ (D) $[1, \frac{7}{3}]$

44. Let $f(x) = -2x - 9$ and $g(x) = 3x + 2$. Find all values for x for which $f(x) > g(x)$.

(A) $\{x | x < -\frac{11}{5}\}$ (B) $\{x | x > 11\}$ (C) $\{x | x > -\frac{11}{5}\}$ (D) $\{x | x < -11\}$

45. Find the minimum value of $F = 3x + 2y$ subject to:

$$x + y \leq 5$$

$$0 \leq x \leq 3$$

$$1 \leq y \leq 4$$

(A) 3 (B) 1 (C) 2 (D) 13

Chapter 5.

46. Given the following functions, which are polynomial functions?

(A) $f(x) = 4x^3 - 3x^2$ (B) $f(x) = \frac{1}{2}x^4$ (C) $f(x) = \sqrt{x}(x - 7)$

(D) $f(x) = x^{-3} + 3x^{-2} - 5x^{-1}$ (E) $f(x) = \frac{x^2 - 5}{x^4}$

a. all of the above d. B only

b. A only e. A and B

c. A and C f. none of the above

47. Evaluate the polynomial for the given value of x . $7x^2 + 8x - 9$ for $x = -2$
(A) 3 (B) -1 (C) -7 (D) -39
48. Subtract. $(-4d^3 - 7d^2 + 8d - 9) - (-3d^2 - 6d + 2)$
(A) $-4d^3 - 4d^2 + 2d - 7$ (B) $-4d^3 - 4d^2 + 14d - 7$
(C) $-4d^3 - 4d^2 + 14d - 11$ (D) $-4d^3 + 4d^2 - 14d - 11$
49. Find the product. $-2x^3(11x + 7)$
(A) $-36x^4$ (B) $22x^4 + 14x^3$ (C) $-22x^4 - 14x^3$ (D) $-22x^3 - 14$
50. Find the product. $(x + 4)(4x - 5)$
(A) $4x^2 + 11x - 20$ (B) $4x^2 - 20x + 11$ (C) $4x^2 + 11x + 11$ (D) $4x^2 + 9x - 20$
51. Factor completely. $4ab^2 - 4a + 16a^2b$
(A) $4a(b^2 + 4ab)$ (B) $4ab(b + 4a)$ (C) $4a(b^2 + 1 + 4ab)$ (D) $4a(b^2 - 1 + 4ab)$
52. Factor. $10x^2 + 6x - 25x - 15$
(A) $(10x - 5)(x + 3)$ (B) $(10x + 5)(x - 3)$
(C) $(2x + 5)(5x - 3)$ (D) $(2x - 5)(5x + 3)$
53. Factor. $12x^2 - 7x - 12$
(A) $(4x + 3)(3x - 4)$ (B) $(12x + 3)(x - 4)$
(C) $(4x - 3)(3x + 4)$ (D) $(12x + 1)(x - 12)$
54. Factor. $9z^6 - 6z^3 - 8$
(A) $(3z^3 + 2)(3z^3 - 4)$ (B) $(3z^3 + 1)(3z^3 - 8)$
(C) $(3z^3 + 4)(3z^3 - 2)$ (D) $9(z^3 - 4)(z^3 + 2)$

55. Factor. $4y^4 - 25$

- (A) $(2y^2 + 5)^2$ (B) $(2y^2 - 5)^2$ (C) $(2y^2 + 5)(2y^2 - 5)$ (D) $(4y^2 + 1)(y^2 - 25)$

56. Factor. $x^2 + 16xy + 64y^2$

- (A) $(x + 4y)^2$ (B) $(x + 8y)^2$ (C) $(x - 8y)^2$ (D) $(x + 8y)(x - 8y)$

57. Factor. $216y^3 - 343$

- (A) $(6y - 7)(36y^2 + 42y + 49)$ (B) $(216y + 7)(y^2 + 42y + 49)$
 (C) $(6y + 7)(36y^2 - 42y + 49)$ (D) $(6y - 7)(36y^2 + 49)$

58. Solve the following equation. $3x^2 - 18x + 24 = 0$

- (A) $\{0, 2, 4\}$ (B) $\{3, 2, 4\}$ (C) $\{-2, -4\}$ (D) $\{2, 4\}$

59. The square of a positive number plus the number is 240. What is the number?

- (A) 15 (B) 16 (C) 20 (D) 18

Chapter 6.

60. Simplify this rational expression: $\frac{a^2 - 2a}{a^2 + 6a - 16}$

- (A) $\frac{a-2}{a+8}$ (B) $\frac{1}{a+8}$ (C) $\frac{a^2}{a+8}$ (D) $\frac{a}{a+8}$

61. Divide and simplify, if possible: $\frac{z^2 + 10z + 21}{z^2 + 13z + 42} \div \frac{z^2 + 3z}{z^2 + 14z + 48}$

- (A) $\frac{z}{z^2 + 13z + 42}$ (B) $\frac{z+8}{z}$ (C) $\frac{z+8}{z^6 + 6z}$ (D) $z + 8$

62. Add: $\frac{2x-1}{x^2-3x-10} + \frac{5}{x-5}$

(A) $\frac{2}{x-5}$ (B) $\frac{7x+1}{(x-5)(x+2)}$ (C) $\frac{7x+9}{(x-5)(x+2)}$ (D) $\frac{2x+4}{(x-5)(x+2)}$

63. Simplify: $\frac{25s^2-36t^2}{\frac{5}{t}-\frac{6}{s}}$

(A) $5s + 6t$ (B) $\frac{6s+5t}{st}$ (C) $6s + 5t$ (D) $\frac{st}{5s+6t}$

64. Solve the equation: $\frac{15}{x} - \frac{15}{x-2} = -2$

(A) $x = -5$ or $x = 3$ (B) $x = 5$ or $x = -3$

(C) $x = 28$ (D) $x = -5$ or $x = -3$

65. Maria can paint a room in 6 hours. Katherine can paint the same room in 4 hours. Working together, how long will it take to paint the room?

(A) 2.4 (B) 1.2 (C) 6 (D) 3.2

66. Divide: $\frac{28x^6-32x^5+24x^4}{4x^5}$

(A) $7x - 32x^5 + \frac{6}{x}$ (B) $7x - 8$ (C) $7x - 8 + \frac{6}{x}$ (D) $13x - 8$

67. Divide (use long division): $\frac{w^2+2w-55}{w+9}$

(A) $w + 7w + \frac{8}{w+9}$ (B) $w - 7$ (C) $w - 7 + \frac{8}{w+9}$ (D) $w - 8 + \frac{7}{w+9}$

68. Use synthetic division to find $f(2)$, if $f(x) = 5x^4 - 2x^3 + x + 1$

(A) 35 (B) 29 (C) 67 (D) 95

69. y varies directly as x^2 and inversely as z ; $y = 4$ when $x = 4$ and $z = 2$. Find y when $x = 2$ and $z = 4$.

- (A) $y = 2$ (B) $y = \frac{1}{2}$ (C) $y = -2$ (D) $y = 10$

Chapter 7.

70. Simplify. Assume all variables represent real numbers. $\sqrt{x^2 + 10x + 25}$

- (A) $|x + 5|$ (B) $|x + 25|$ (C) $|x + 10|$ (D) $|x - 5|$

71. Simplify: $\sqrt[3]{48a^7b^4}$

- (A) $3a^2b\sqrt[3]{4ab}$ (B) $2a^2b\sqrt[3]{6ab}$ (C) $4ab\sqrt[3]{ab^2}$ (D) $6a^2b\sqrt[3]{3ab}$

72. Multiply and simplify: $(6 + \sqrt{3})(4 - 3\sqrt{3})$

- (A) $15 - 14\sqrt{3}$ (B) $24 - 22\sqrt{3}$ (C) $24 - 3\sqrt{3}$ (D) 15

73. Simplify: $\frac{\sqrt[5]{a^4}}{\sqrt[4]{a^3}}$

- (A) $\sqrt[20]{a^7}$ (B) \sqrt{a} (C) $\sqrt[20]{a}$ (D) $\sqrt{a^7}$

74. Add and simplify. Assume all variables represent nonnegative real numbers. $\sqrt{xy^3} + \sqrt{25x^3y}$

- (A) $(5x + y)\sqrt{xy}$ (B) $(x^2 + y^2)\sqrt{5xy}$ (C) $(x + 5y)\sqrt{xy}$ (D) $5x^2y^2$

75. Rationalize the denominator: $\frac{6-\sqrt{3}}{4+5\sqrt{3}}$

- (A) $\frac{5-13\sqrt{3}}{17}$ (B) $\frac{-39+34\sqrt{3}}{59}$ (C) $\frac{-9+34\sqrt{3}}{59}$ (D) $\frac{9-26\sqrt{3}}{7}$

76. Solve the following: $\sqrt{12-x} = x$

- (A) $x = 6$ (B) $x = -6$ (C) $x = \{-3, 4\}$ (D) $x = \{-4, 3\}$ (E) $x = 3$

77. Find one of the solutions of $x = \sqrt{3x-8} + 4$

- (A) 8 (B) 3 (C) 4 (D) 2

78. The base of a 45-ft. long guy wire is located 18 feet from the telephone pole that it is anchoring. How high up the pole does the guy wire reach?

- (A) 27 ft (B) 48.466 ft (C) 41.243 ft (D) 45.200 ft

79. Multiply: $(4-i)^2$

- (A) $17-4i$ (B) $16+2i$ (C) $15-8i$ (D) $17-8i$

80. Divide: $\frac{4-3i}{2+5i}$

- (A) $\frac{23}{29} - \frac{28}{29}i$ (B) $-\frac{7}{29} - \frac{26}{29}i$ (C) $-\frac{7}{29} + \frac{14}{29}i$ (D) $\frac{1}{3}$

81. Find the value of i^{50} .

- (A) -1 (B) 1 (C) $-i$ (D) i

Chapter 8.

82. Solve by completing the square: $x^2 - 12x - 7 = 0$

- (A) $6 \pm \sqrt{83}$ (B) $-7 \pm \sqrt{22}$ (C) $6 \pm \sqrt{43}$ (D) $-12 \pm 2\sqrt{22}$

83. Solve $3x^2 - 10x + 5 = 0$. Simplify your answer.

- (A) $\frac{5 \pm \sqrt{10}}{3}$ (B) $\frac{5 \pm \sqrt{17}}{3}$ (C) $\frac{10 \pm \sqrt{10}}{3}$ (D) $5 \pm \sqrt{10}$

84. Use Figure (4) to graph the function $f(x) = -3(x + 2)^2 - 1$.

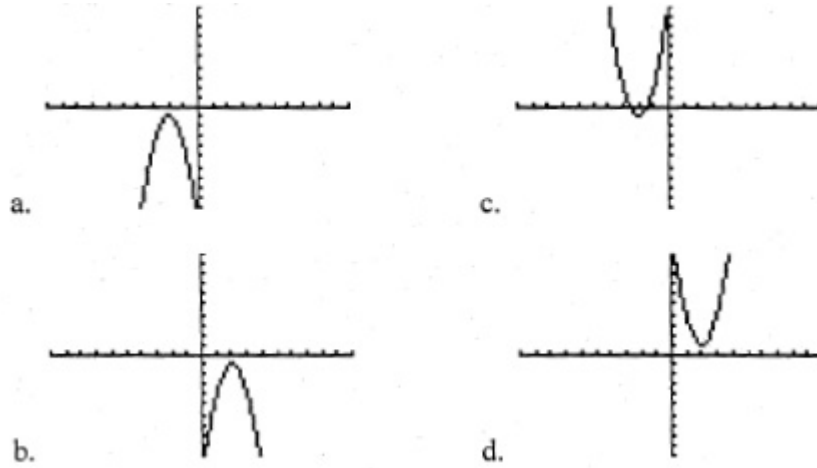


FIGURE 4