

**Cumulative Review**

For use after Chapters 1–5

**Evaluate the expression. (1.1)**

1.  $-3 + 3(-2 + 5)^2$

2.  $(-5)^2$

3.  $-5^2$

**Simplify and evaluate the expression for the given value of the variable. (1.2)**

4.  $x^2 + 8 - x$  when  $x = -2$

5.  $3a^2 + a - 2a^2$  when  $a = 3$

6.  $2(n + 1) - 4(n - 2)$  when  $n = -1$

**Solve the equation. (1.3)**

7.  $\frac{1}{2}x + \frac{1}{3} = 2x - \frac{1}{5}$

8.  $3(2x - 1) = -4(-x + 1) + 5$

**Solve the inequality and draw its graph. (1.5)**

9.  $3x + 1 < 2x + 3$

10.  $2x - 3 \geq 5x + 1$

11.  $-4x + 3 > 3x$

**Solve the compound inequality. (1.6)**

12.  $3x + 1 < 2x + 9$  or  $5x + 3 < 53$

13.  $-4 < -2x + 4 < 12$

**Solve the absolute value equation or inequality. (1.7)**

14.  $|3x - 5| = 10$

15.  $|4x - 2| > 10$

16.  $|x - 2| < 6$

**Evaluate the function when  $x = 5$ . (2.1)**

17.  $g(x) = -x^2 + 2$

18.  $f(x) = (-x)^2 + 2$

19.  $f(x) = (x - 3)^2 + 5$

**Find the slope of the line passing through the points. (2.2)**

20.  $(4, -3)$  and  $(6, 5)$

21.  $(2, 0)$  and  $(8, 0)$

22.  $(5, 8)$  and  $(5, 14)$

**Tell whether the two lines are *parallel*, *perpendicular*, or *neither*. (2.2)**

23. Line 1: through  $(-5, 3)$  and  $(8, 4)$

24. Line 1: through  $(5, -9)$  and  $(-2, 5)$

Line 2: through  $(2, 7)$  and  $(1, 20)$

Line 2: through  $(6, 3)$  and  $(9, 9)$

**Write the equation with the given slope and  $y$ -intercept. (2.3)**

25.  $m = 5; b = 3$

26.  $m = 0; b = 4$

27.  $m = \frac{2}{3}; b = -2$

**Graph the equation. (2.3)**

28.  $y = \frac{-2}{3}x + 5$

29.  $y = 4x - 6$

30.  $y = 5x$

**Write the equation of the line that passes through the given point and has the given slope. (2.4)**

31.  $(5, -1); m = \frac{1}{3}$

32.  $(6, 0); m = -2$

33.  $(4, 5); m = 1$

**Graph the inequality. (2.6)**

34.  $y \geq \frac{2}{3}x - 3$

35.  $y < -x + 5$

36.  $2x - y < 4$

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**Solve the linear system. (3.2, 3.6)**

$$\begin{aligned} 37. \quad 2x + 3y &= 14 \\ -x + 5y &= 19 \end{aligned}$$

$$\begin{aligned} 38. \quad 3x + 5y &= 14 \\ 2x - 3y &= -16 \end{aligned}$$

$$\begin{aligned} 39. \quad 2x + 3y - z &= 11 \\ 4x - y + 2x &= -1 \\ 3x + 2y + 2z &= 0 \end{aligned}$$

**Graph the system of linear inequalities. (3.5)**

$$\begin{aligned} 40. \quad y &< x - 2 \\ y &> -3x + 1 \end{aligned}$$

$$\begin{aligned} 41. \quad y &> 3x - 2 \\ y &> -2x + 1 \end{aligned}$$

$$\begin{aligned} 42. \quad 3x + y &\geq 5 \\ -2x + y &\leq 3 \end{aligned}$$

**Perform the indicated operation. (4.1)**

$$43. \quad \begin{bmatrix} 1 & -3 \\ 6 & 2 \end{bmatrix} + 3 \begin{bmatrix} -3 & 5 \\ 2 & 0 \end{bmatrix}$$

**Use Cramer's Rule to solve the system. (4.3)**

$$\begin{aligned} 44. \quad 2x + 3y &= 11 \\ x - 4y &= -11 \end{aligned}$$

$$\begin{aligned} 45. \quad -2x + 2y &= 0 \\ 5x - 3y &= 4 \end{aligned}$$

$$\begin{aligned} 46. \quad 4x - 2y + 3z &= 14 \\ 2x + y - 5z &= 5 \\ -3x - 2y + 5z &= -7 \end{aligned}$$

**Use matrices to solve the linear system. (4.5)**

$$\begin{aligned} 47. \quad -2x + 4y &= 22 \\ 3x - y &= -13 \end{aligned}$$

$$\begin{aligned} 48. \quad 3x - 2y &= 7 \\ 5x + 4y &= -3 \end{aligned}$$

$$\begin{aligned} 49. \quad x + 2y - 3z &= 10 \\ 2x - 3y + 4z &= -10 \\ -2x + 3y - 5z &= 13 \end{aligned}$$

**Graph the quadratic function. Label the vertex and the axis of symmetry. (5.1, 5.3)**

$$50. \quad y = (x - 3)^2 + 5$$

$$51. \quad y = 3(x - 1)(x + 1)$$

$$52. \quad y = 3x^2 + 6x - 2$$

**Solve the equation. (5.3, 5.5)**

$$53. \quad 3(x - 5)^2 = 27$$

$$54. \quad x^2 + 12x + 3 = 0$$

$$55. \quad x^2 + 6x + 8 = 0$$

**Write the expression as a complex number in standard form. (5.4)**

$$56. \quad (4 - 3i) - (2 + 5i)$$

$$57. \quad (7 + 3i)(2 - i)$$

$$58. \quad (-6 + 2i) + (3 - 5i)$$

$$59. \quad (-3 - 2i)(4 + 5i)$$

$$60. \quad \frac{3 + 2i}{4 - i}$$

$$61. \quad \frac{4 + i}{4 - i}$$