# Cumulative Practice

**Translate the verbal sentence into an equation or an inequality. Then use the information to solve for the variable(s).  (1.4–1.5)**

**1.** The quotient of $m$ and 7 is greater than or equal to 16.

**2.** The sum of 4 and the second power of $b$ is equal to 104.

**3.** The distance $t$ you travel by train is $3\frac{2}{3}$ times the distance $d$ you live from the train station. You drive 3 miles to get from your house to the train station.

**Evaluate the expression for the given value of $x$.  (2.1–2.3, 2.5–2.7)**

**4.** $3 + x + (-4)$, $x = 5$

**5.** $-x + 12 - 5$, $x = 9$

**6.** $3.5 - (-x)$, $x = 1.5$

**7.** $-(-3)^2(x)$, $x = 7$

**8.** $6x(x + 2)$, $x = 2$

**9.** $(8x + 1)(-3)$, $x = \frac{1}{2}$

**10.** $\frac{1}{4}\left|(-x)(-x)(-x)\right|$, $x = 4$

**11.** $\frac{x^2 + 4}{6}$, $x = 8$

**12.** $(-5)\left(-\frac{3}{4}x\right)$, $x = 6$

**Solve the equation. Round the result to the nearest hundredth.  (3.1–3.4, 3.6)**

**13.** $-\frac{2}{9}(x - 5) = 12$

**14.** $7x - (3x - 2) = 38$

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

**16.** $8(x + 3) - 2x = 4(x - 8)$

**17.** $11.47 + 6.23x = 7.62 + 5.51x$

**18.** $-3(2.98 - 4.1x) = 9.2x + 6.25$

**In Exercises 19 and 20, use the graph.  (4.3–4.4, 4.6, 5.3)**
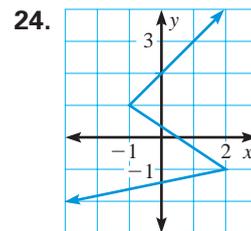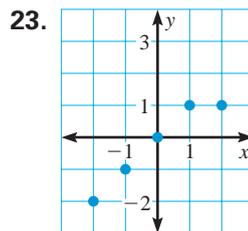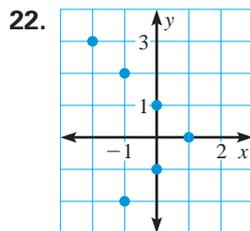
**19.** Write an equation of a line that is parallel to the line shown.

**20.** Write an equation of a line that is perpendicular to the line shown. Graph the equation in the same coordinate plane to check your answer.
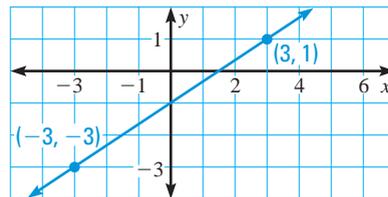
**Decide whether the relation is a function. If it is a function, give the domain and the range.  (4.8)**

**21.**

| Input | Output |
|-------|--------|
| −1 | −1 |
| 1 | −1 |
| 3 | 1 |
| 5 | 3 |
| 7 | 5 |

**22.**

**23.**

**24.**

**Use the information provided to write an equation of the line in standard form. (5.1–5.2, 5.5–5.6)**

**25.** The slope is $\frac{4}{5}$; the $y$-intercept is $-3$.

**26.** The line passes through $(-1, 2)$; the slope is $\frac{1}{3}$.

**Solve the inequality and graph the solution.  (6.3–6.4)**

**27.** $-3 < -4x + 9 \le 14$

**28.** $\left|3x + 16\right| + 2 < 10$

**29.** $3x - 4 > 5$ or $5x + 1 < 11$

**Solve the system of linear equations.** (7.2–7.3)

**30.** $4y = -8x + 16$
$\quad\;\; 2y = 11x - 7$

**31.** $-2x + 3y = 15$
$\quad\;\; 10x - 11y = 9$

**32.** $y = 5x - 2$
$\quad\;\; 3x + 7y = 5$

**Simplify. Then evaluate the expression when $a = 1$ and $b = 2$.** (8.1–8.3)

**33.** $\dfrac{b^8}{b^2}$

**34.** $3a^4 \cdot a^{-3}$

**35.** $\left(-a^3\right)\left(2b^2\right)^3$

**36.** $4b^3 \cdot (2 + b)^2$

**37.** $\dfrac{4a^{-3}b^3}{ab^{-2}}$

**38.** $\dfrac{\left(5ab^2\right)^{-2}}{a^{-3}b}$

**Decide how many solutions the equation has. Then solve the equation.**
(9.1, 9.5–9.6, 10.5)

**39.** $6x^2 + 8 = 34$

**40.** $4x^2 - 9x + 5 = 0$

**41.** $3x^2 + 6x + 3 = 0$

**Completely factor the expression.** (10.5–10.7)

**42.** $x^2 + 6x + 8$

**43.** $x^2 - 24x - 112$

**44.** $3x^2 + 17x - 6$

**45.** $4x^2 + 12x + 9$

**46.** $x^2 + 10x + 25$

**47.** $x^2 - 14x + 49$

**Solve the equation.** (10.4–10.8)

**48.** $(3x + 1)(2x + 7) = 0$

**49.** $6x^2 - x - 7 = 8$

**50.** $4x^2 + 16x + 16 = 0$

**51.** $x^3 + 5x^2 - 4x - 20 = 0$

**52.** $x^4 + 9x^3 + 18x^2 = 0$

**53.** $x^2 - \dfrac{4}{3}x + \dfrac{4}{9} = 0$

**Simplify the expression.** (11.4–11.6)

**54.** $\dfrac{4x}{12x^2}$

**55.** $\dfrac{2x + 6}{x^2 - 9}$

**56.** $\dfrac{3x}{x^2 - 2x - 24} \cdot \dfrac{x - 6}{6x^2 + 9x}$

**57.** $\dfrac{x^2 - 6x + 8}{x^2 - 2x} \div (3x - 12)$

**58.** $\dfrac{4}{x + 2} + \dfrac{15x}{3x + 6}$

**59.** $\dfrac{3x}{x + 4} - \dfrac{x}{x - 1}$

**Simplify the expression.** (12.2)
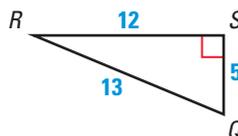
**60.** $4\sqrt{7} + 3\sqrt{7}$

**61.** $9\sqrt{2} - 12\sqrt{8}$

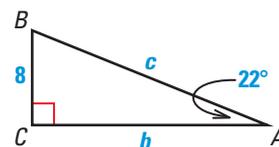**62.** $\sqrt{6}\left(5\sqrt{3} + 6\right)$

**63.** $\dfrac{11}{7 - \sqrt{3}}$

**In Exercises 64 and 65, use the triangles at the right.** (12.7)

**64.** Find the sine, the cosine, and the tangent of
$\angle Q$ and $\angle R$. Round your answer to the
nearest hundredth.

**65.** Find the lengths of the sides of $\triangle ABC$.
Tan $22° = 0.4040$. Round your answer
to the nearest hundredth.

🌎 **PVR SUBSCRIPTIONS** In Exercises 66 and 67, Company A sells a
Personal Video Recorder (PVR) for $700 and charges a $5 monthly
subscription fee. Company B sells a PVR for $500 and charges a $20
monthly fee. (6.2, 7.3–7.4)

**66.** What is the total cost of each PVR after one year? after three years?

**67.** How many months must the PVRs be used in order for the total costs of the
two models to be the same?