

CHAPTER 1 TEST

In Exercises 1–23, solve each equation or inequality. Other than \emptyset , use interval notation to express solution sets of inequalities and graph these solution sets on a number line.

- $7(x - 2) = 4(x + 1) - 21$
- $-10 - 3(2x + 1) - 8x - 1 = 0$
- $\frac{2x - 3}{4} = \frac{x - 4}{2} - \frac{x + 1}{4}$
- $\frac{2}{x - 3} - \frac{4}{x + 3} = \frac{8}{x^2 - 9}$
- $2x^2 - 3x - 2 = 0$
- $(3x - 1)^2 = 75$
- $(x + 3)^2 + 25 = 0$
- $x(x - 2) = 4$
- $4x^2 = 8x - 5$
- $x^3 - 4x^2 - x + 4 = 0$
- $\sqrt{x - 3} + 5 = x$
- $\sqrt{8 - 2x} - x = 0$
- $\sqrt{x + 4} + \sqrt{x - 1} = 5$
- $5x^{\frac{3}{2}} - 10 = 0$
- $x^{\frac{2}{3}} - 9x^{\frac{1}{3}} + 8 = 0$
- $\left|\frac{2}{3}x - 6\right| = 2$
- $-3|4x - 7| + 15 = 0$
- $\frac{1}{x^2} - \frac{4}{x} + 1 = 0$
- $\frac{2x}{x^2 + 6x + 8} + \frac{2}{x + 2} = \frac{x}{x + 4}$
- $3(x + 4) \geq 5x - 12$
- $\frac{x}{6} + \frac{1}{8} \leq \frac{x}{2} - \frac{3}{4}$
- $-3 \leq \frac{2x + 5}{3} < 6$
- $|3x + 2| \geq 3$

In Exercises 24–25, use interval notation to represent all values of x satisfying the given conditions.

- $y = 2x - 5$, and y is at least -3 and no more than 7 .
- $y = \left|\frac{2 - x}{4}\right|$ and y is at least 1 .

In Exercises 26–27, use graphs to find each set.

- $[-1, 2) \cup (0, 5]$
- $[-1, 2) \cap (0, 5]$

In Exercises 28–29, solve each formula for the specified variable.

- $V = \frac{1}{3}lwh$ for h
- $y - y_1 = m(x - x_1)$ for x

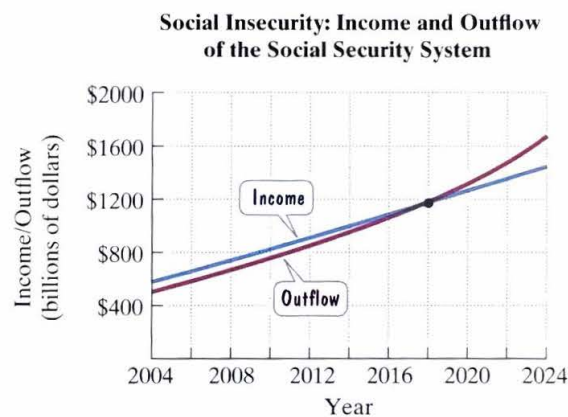
In Exercises 30–31, graph each equation in a rectangular coordinate system.

- $y = 2 - |x|$
- $y = x^2 - 4$

In Exercises 32–34, perform the indicated operations and write the result in standard form.

- $(6 - 7i)(2 + 5i)$
- $\frac{5}{2 - i}$
- $2\sqrt{-49} + 3\sqrt{-64}$

The graphs show the amount being paid in Social Security benefits and the amount going into the system. All data are expressed in billions of dollars. Amounts from 2016 through 2024 are projections.



Source: 2004 Social Security Trustees Report

Exercises 35–37 are based on the data shown by the graphs.

- In 2004, the system's income was \$575 billion, projected to increase at an average rate of \$43 billion per year. In which year will the system's income be \$1177 billion?
- The data for the system's outflow can be modeled by the formula

$$B = 0.07x^2 + 47.4x + 500,$$

where B represents the amount paid in benefits, in billions of dollars, x years after 2004. According to this model, when will the amount paid in benefits be \$1177 billion? Round to the nearest year.

- How well do your answers to Exercises 35 and 36 model the data shown by the graphs?