Use the graph of \( f \) to solve.

1) List the two values of \( x \) for which \( f(x) = 0 \)

Solve the problem.

2) Find the domain of \( \frac{f}{g} \) when \( f(x) = 6x^2 + 10x - 3 \) and \( g(x) = x - 6 \).

Use the given conditions to write an equation for the line in slope-intercept form.

3) Passing through \((3, 5)\) and perpendicular to the line whose equation is \( y = 7x + 9 \).

Solve the system by graphing.

4) \( 3x + y = -4 \)
\( 4x + 3y = 3 \)

Solve by eliminating variables using the addition method.

5) \( x + y + z = 4 \)
\( x - y + 3z = 16 \)
\( 2x + y + z = 6 \)

Solve and graph the solution set on a number line. Express the solution set in both set-builder and interval notations.

6) \( \frac{x}{6} - \frac{1}{2} \leq \frac{x}{4} + 1 \)

Find the solution set for the equation.

7) \( |3x - 7| = 2 \)

Solve and graph the solution set on a number line. Express the solution set in both set-builder and interval notations.

8) \( |3x - 7| \leq 3 \)

Solve the polynomial equation.

9) \( 4x^2 = 4 - 6x \)

Divide using long division.

10) \( (3x^5 - x^3 - 2x^2 - 135x + 14) ÷ (x^2 - 7) \)

Simplify each rational expression.

11) \( \frac{x}{25} - \frac{1}{x} \)
\( 1 + \frac{5}{x} \)

Solve using the four requirements.

12) Given that \( f(x) = x^4 + 2x^3 - 16x^2 + 8x - 154 \), use synthetic division and the Remainder Theorem to find \( f(4) \).

13) A boat moves 10 kilometers upstream in the same amount of time it moves 18 kilometers downstream. If the rate of the current is 5 kilometers per hour, find the rate of the boat in still water.

Perform the indicated operation and, if possible, simplify. Assume that all variables represent positive real numbers.

14) \( (5 + \sqrt{2})^2 \)

Rationalize the denominator. Simplify, if possible. Assume that any variables represent positive real numbers.

15) \( \frac{\sqrt{7} + \sqrt{2}}{\sqrt{7} - \sqrt{2}} \)

Solve the radical equation.

16) \( x = \sqrt{4x + 9} + 9 \)

Perform the indicated operation. Write the result in the form \( a + bi \).

17) \( \frac{7 - 2i}{3 + i} \)

18) Simplify: \( i^{23} \)

Find the distance between the pair of points. Give an exact answer.

19) \((6, -7) \) and \((4, -3)\)

Find the midpoint of the line segment with the given endpoints.

20) \( \left\{ \frac{9}{2}, -1 \right\} \) and \((-2, 2)\)