

MORE ON FUNCTIONS

For problems 1-21, find the domain of the function.

$$1) f(x) = \frac{1}{x-2}$$

$$2) f(x) = \frac{x-2}{x^2+5x+6}$$

$$3) f(x) = \frac{2}{4-x^2}$$

$$4) f(x) = \frac{1}{x^2-7x+2}$$

$$5) f(x) = \frac{1}{x^2+1}$$

$$6) f(x) = \frac{x-2}{x(x+1)(x-3)}$$

$$7) f(x) = \frac{4x^2}{3x^2+6x}$$

$$8) f(x) = \frac{2}{|3x+2|-1}$$

$$9) f(x) = \frac{1-x-x^2}{4|4-2x|+1}$$

$$10) f(x) = \sqrt{\frac{1}{3}x+2}$$

$$11) f(x) = \frac{-1}{\sqrt{3-2x}}$$

$$12) f(x) = \sqrt{6+x-x^2}$$

$$13) f(x) = \sqrt{\frac{1-x}{x}}$$

$$14) f(x) = \sqrt{x^2-4}$$

$$15) f(x) = \sqrt[3]{x+2}$$

$$16) f(x) = \sqrt{3x^2-x-2}$$

$$17) f(x) = \frac{x}{\sqrt{x^2-4x-5}}$$

$$18) f(x) = \frac{4}{\sqrt{4x+1}-2}$$

$$19) f(x) = \frac{3x-2}{\sqrt{x+5}+1}$$

For problems 22-25, find the x-intercept(s).

$$20) f(x) = 3x^2 - 7x - 1$$

$$21) f(x) = 3(x-2) - (1-3x) - 1$$

$$22) f(x) = |2x+3| - 7$$

$$23) f(x) = \sqrt[4]{3x+1} - 2$$

$$24) f(x) = (3x-5)^{\frac{1}{2}} - 2$$

$$25) f(x) = (2x+1)^{\frac{1}{3}} + 1$$

26) Find the values of x where the graph of $f(x) = \frac{3x^2}{x^2-1}$ lies below the x-axis.

27) Find the values of x where the graph of $f(x) = |2x+3|$ lies below the graph of $f(x) = 4$.

28) Find the values of x where the graph of $f(x) = |4-2x|$ lies below the graph of $f(x) = 6$.

29) Find the values of x where the graph of $f(x) = |7-x|$ lies above the graph of $f(x) = 1$.

30) Find the values of x where the graph of $f(x) = |5x+8|$ lies above the graph of $f(x) = 2$.

ANSWERS

- 1) $\{x|x \neq 2\}$ or $(-\infty, 2) \cup (2, \infty)$
- 2) $\{x|x \neq -3, x \neq -2\}$ or $(-\infty, -3) \cup (-3, -2) \cup (-2, \infty)$
- 3) $\{x|x \neq -2, x \neq 2\}$ or $(-\infty, -2) \cup (-2, 2) \cup (2, \infty)$
- 4) $\{x|x \neq \frac{7 \pm \sqrt{41}}{2}\}$ or $(-\infty, \frac{7 - \sqrt{41}}{2}) \cup (\frac{7 - \sqrt{41}}{2}, \frac{7 + \sqrt{41}}{2}) \cup (\frac{7 + \sqrt{41}}{2}, \infty)$
- 5) All real numbers or $(-\infty, \infty)$
- 6) $\{x|x \neq -1, x \neq 0, x \neq 3\}$ or $(-\infty, -1) \cup (-1, 0) \cup (0, 3) \cup (3, \infty)$
- 7) $\{x|x \neq -2, x \neq 0\}$ or $(-\infty, -2) \cup (-2, 0) \cup (0, \infty)$
- 8) $\{x | x \neq -\frac{1}{3}, x \neq -1\}$ or $(-\infty, -1) \cup (-1, -\frac{1}{3}) \cup (-\frac{1}{3}, \infty)$
- 9) All real numbers or $(-\infty, \infty)$
- 10) $\{x|x \geq -6\}$ or $[-6, \infty)$
- 11) $\{x|x < \frac{3}{2}\}$ or $(-\infty, \frac{3}{2})$
- 12) $\{x|-2 \leq x \leq 3\}$ or $[-2, 3]$
- 13) $\{x|0 < x \leq 1\}$ or $(0, 1]$
- 14) $\{x|x \leq -2 \text{ or } x \geq 2\}$ or $(-\infty, -2] \cup [2, \infty)$
- 15) All real numbers or $(-\infty, \infty)$
- 16) $\{x|x \leq -\frac{2}{3} \text{ or } x \geq 1\}$ or $(-\infty, -\frac{2}{3}] \cup [1, \infty)$
- 17) $\{x|x < -1 \text{ or } x > 5\}$ or $(-\infty, -1) \cup (5, \infty)$
- 18) $\{x|x \geq -\frac{1}{4}, x \neq \frac{3}{4}\}$ or $[-\frac{1}{4}, \frac{3}{4}) \cup (\frac{3}{4}, \infty)$
- 19) $\{x|x \geq -5\}$ or $[-5, \infty)$
- 20) $(\frac{7 \pm \sqrt{61}}{6}, 0)$
- 21) $(\frac{4}{3}, 0)$
- 22) $(2, 0), (-5, 0)$
- 23) $(5, 0)$
- 24) $(3, 0)$
- 25) $(-1, 0)$
- 26) $-1 < x < 0 \text{ or } 0 < x < 1$ or $(-1, 0) \cup (0, 1)$
- 27) $-\frac{7}{2} < x < \frac{1}{2}$ or $(-\frac{7}{2}, \frac{1}{2})$
- 28) $-1 < x < 5$ or $(-1, 5)$
- 29) $x < 6 \text{ or } x > 8$ or $(-\infty, 6) \cup (8, \infty)$
- 30) $x < -2 \text{ or } x > -\frac{6}{5}$ or $(-\infty, -2) \cup (-\frac{6}{5}, \infty)$