

7.3 Worksheet

4. Use roots and test points to determine the solution to each inequality.

- a) $x(x + 6) \geq 40$
- b) $-x^2 - 14x - 24 < 0$
- c) $6x^2 > 11x + 35$
- d) $8x + 5 \leq -2x^2$

5. Use sign analysis to determine the solution to each inequality.

- a) $x^2 + 3x \leq 18$
- b) $x^2 + 3 \geq -4x$
- c) $4x^2 - 27x + 18 < 0$
- d) $-6x \geq x^2 - 16$

8. Solve each of the following inequalities. Explain your strategy and why you chose it.

- a) $x^2 - 10x + 16 < 0$
- b) $12x^2 - 11x - 15 \geq 0$

15. For each of the following, give an inequality that has the given solution.

- a) $-2 \leq x \leq 7$
- b) $x < 1$ or $x > 10$
- c) $\frac{5}{3} \leq x \leq 6$
- d) $x < -\frac{3}{4}$ or $x > -\frac{1}{5}$
- e) $x \leq -3 - \sqrt{7}$ or $x \geq -3 + \sqrt{7}$
- f) $x \in \mathbb{R}$
- g) no solution

Answers

4. a) $\{x \mid x \leq -10 \text{ or } x \geq 4, x \in \mathbb{R}\}$

b) $\{x \mid x < -12 \text{ or } x > -2, x \in \mathbb{R}\}$

c) $\{x \mid x < -\frac{5}{3} \text{ or } x > \frac{7}{2}, x \in \mathbb{R}\}$

d) $\{x \mid -2 - \frac{\sqrt{6}}{2} \leq x \leq 2 + \frac{\sqrt{6}}{2}, x \in \mathbb{R}\}$

5. a) $\{x \mid -6 \leq x \leq 3, x \in \mathbb{R}\}$

b) $\{x \mid x \leq -3 \text{ or } x \geq -1, x \in \mathbb{R}\}$

c) $\{x \mid \frac{3}{4} < x < 6, x \in \mathbb{R}\}$

d) $\{x \mid -8 \leq x \leq 2, x \in \mathbb{R}\}$

8. a) $\{x \mid 2 < x < 8, x \in \mathbb{R}\}$

Example: Use graphing because it is a simple graph to draw.

b) $\{x \mid x \leq -\frac{3}{4} \text{ or } x \geq \frac{5}{3}, x \in \mathbb{R}\}$

Example: Use sign analysis because it is easy to factor.

15. Examples:

a) $x^2 - 5x - 14 \leq 0$ b) $x^2 - 11x + 10 > 0$

c) $3x^2 - 23x + 30 \leq 0$ d) $20x^2 + 19x + 3 > 0$

e) $x^2 + 6x + 2 \geq 0$ f) $x^2 + 1 > 0$

g) $x^2 + 1 < 0$