

2.20 Solving Inequalities

1. Graph each of the following on a number line.

“Or” means that if either test is satisfied, then the value belongs to the set.

“And” requires that both tests are satisfied before the value is included in the set.

(a) $\{x \mid 3 < x \leq 5, x \in \mathbf{N}\}$

(b) $\{x \mid x \geq -1, x \in \mathbf{R}\}$

(c) $\{s \mid s < -3, s \in \mathbf{R}\}$

(d) $\{t \mid 1 < t < 2, t \in \mathbf{R}\}$

(e) $\{x \mid -3 \leq x < 1, x \in \mathbf{R}\}$

(f) $\{u \mid 3 \geq u \geq 1, u \in \mathbf{R}\}$

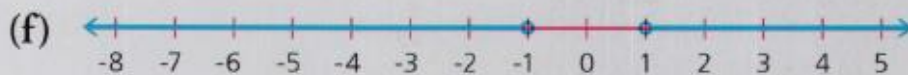
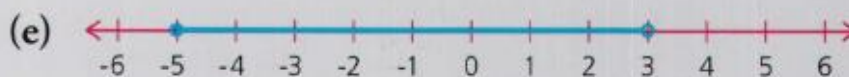
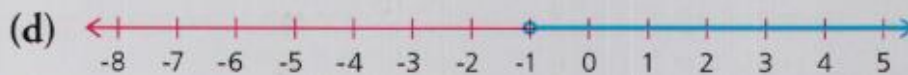
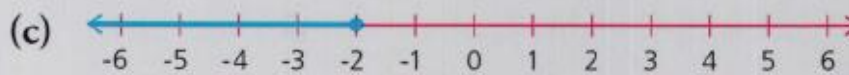
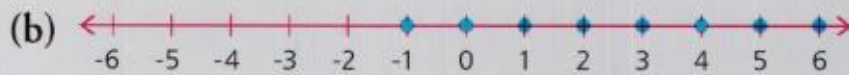
(g) $\{x \mid x < -3 \text{ or } x > 2, x \in \mathbf{R}\}$

(h) $\{x \mid x < 5 \text{ and } x \geq 2, x \in \mathbf{R}\}$

(i) $\{x \mid x^2 \leq 16, x \in \mathbf{R}\}$

(j) $\{s \mid s^2 > 9, s \in \mathbf{R}\}$

2. Describe each of the following in set notation.



3. Solve and graph each solution set.

(a) $3a - 2 \leq 7$

(b) $3 - 7t > 17$

(c) $5 - 2x > x - 7$

(d) $2(s + 3) - 3(s - 5) \geq 12$

(e) $10 < 5 - (2x - 1)$

(f) $x^2 > 1$

(g) $r^2 \leq 25$

(h) $t + 1 < \frac{3t - 1}{2}$

4. Solve and graph.

(a) $1 \leq x + 3 < 4$

(b) $-1 \leq \frac{x}{3} - 1 < 2$

(c) $4 < \frac{4 - 2b}{-3} < 8$

(d) $2x^2 - 7 \leq 11$