

1. Plot the following sets on the real number line.

(a) $\{x \mid -3 < x < 3\}$ (b) $\{x \mid -3 \leq x \leq 3\}$ (c) $\{x \mid -3 \leq x < 3\}$ (d) $x > -2$

(e) $x \leq 5$ (f) $2 \geq x \geq -4$ (g) $x < 0$ or $x > 3$ (h) $x \in \mathbb{R}$

2. Express the following sets using interval notation.

(a) $x < -5$ (b) $x \geq -2$ (c) $-3 \leq x < 3$ (d) $1 > x$

(e) $x \leq -4$ (f) $-7 < x \leq 2$ (g) $x < 0$ or $x > 3$ (h) $x < -1$ or $x \geq 2$

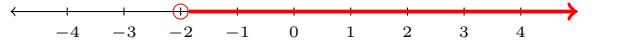
(i) $x \neq 3$ (j) $x \neq -1$ or $x \neq 5$ (k) $x \in \mathbb{R}$

Answers

1. (a)  A red horizontal number line with tick marks every 1 unit, labeled from -4 to 4. There are open circles at -3 and 3, and the line is shaded red between them.

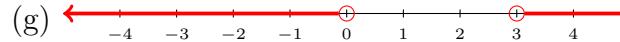
(b)  A red horizontal number line with tick marks every 1 unit, labeled from -4 to 4. There are closed circles at -3 and 3, and the line is shaded red between them.

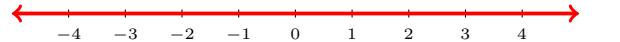
(c)  A red horizontal number line with tick marks every 1 unit, labeled from -4 to 4. There is a closed circle at -3 and an open circle at 3, and the line is shaded red between them.

(d)  A red horizontal number line with tick marks every 1 unit, labeled from -4 to 4. There is an open circle at -2 and a plus sign at 2, and the line is shaded red between them.

(e)  A red horizontal number line with tick marks every 1 unit, labeled from -2 to 6. There is a closed circle at 5, and the line is shaded red to the right of 5.

(f)  A red horizontal number line with tick marks every 1 unit, labeled from -4 to 4. There are closed circles at -4 and 2, and the line is shaded red between them.

(g)  A red horizontal number line with tick marks every 1 unit, labeled from -4 to 4. There is an open circle at 0 and an open circle at 3, and the line is shaded red between them.

(h)  A red horizontal number line with tick marks every 1 unit, labeled from -4 to 4. There are arrows at both ends, indicating the line extends infinitely in both directions.

2. (a) $x \in (-\infty, -5)$

(b) $x \in [-2, \infty)$

(c) $x \in [-3, 3)$

(d) $x \in (-\infty, 1)$

(e) $x \in (-\infty, -4]$

(f) $x \in (-7, 2]$

(g) $x \in (-\infty, 0) \cup (3, \infty)$

(h) $x \in (-\infty, -1) \cup [2, \infty)$

(i) $x \in (-\infty, 3) \cup (3, \infty)$

(j) $x \in (-\infty, -1) \cup (-1, 5) \cup (5, \infty)$

(k) $x \in (-\infty, \infty)$