

Solve for x. Express your answer using interval notation.

1. $2x - 3 > 6 - x$

$$3x > 9$$

$$x > 3$$



$$(3, \infty)$$

2. $x^2 - 6x > -9$

$$x^2 - 6x + 9 > 0$$

$$(x - 3)(x - 3) > 0$$

$$x = 3$$

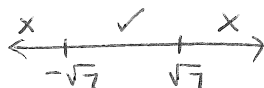


$$(-\infty, 3) \cup (3, \infty)$$

3. $x^2 < 7$

$$\sqrt{x^2} < \sqrt{7}$$

$$x < \pm\sqrt{7}$$



$$(-\sqrt{7}, \sqrt{7})$$

4. $2 < 2x - 4 \leq 8$

$$2 < 2x - 4$$

$$6 < 2x$$

$$3 < x$$

$$2x - 4 \leq 8$$

$$2x \leq 12$$

$$x \leq 6$$



$$(3, 6]$$

5. $|x - 3| \leq 5$

$$x - 3 \leq 5$$

$$x - 3 \geq -5$$

$$x \leq 8 \text{ and } x \geq -2$$



$$[-2, 8]$$

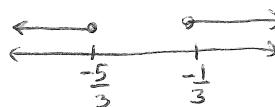
6. $|x + 1| \geq \frac{2}{3}$

$$x + 1 \geq \frac{2}{3}$$

$$x + 1 \leq -\frac{2}{3}$$

$$x \geq -\frac{1}{3}$$

$$x \leq -\frac{5}{3}$$



$$(-\infty, -\frac{5}{3}] \cup [-\frac{1}{3}, \infty)$$

7. $2|x + 2| - 3 < 9$

$$2|x + 2| < 12$$

$$|x + 2| < 6$$

$$x + 2 < 6 \text{ and } x + 2 > -6$$

$$x < 4 \text{ and } x > -8$$

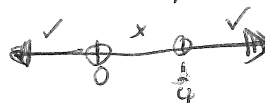


$$(-8, 4)$$

8. $\frac{1}{x} < \frac{4}{1}$ $x \neq 0$

$$4x < 1$$

$$x < \frac{1}{4}$$



$$(-\infty, 0) \cup (\frac{1}{4}, \infty)$$

Practice.

Solve each inequalities and express your answer in interval notation.

1) $-3(2x-5) < 117$

$$2x-5 > -39$$

$$2x > -34$$

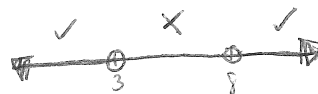
$$x > -17$$

$$(-17, \infty)$$

2) $x^2 - 11x + 5 > -19$

$$x^2 - 11x + 24 > 0$$

$$(x-8)(x-3) > 0$$



$$(-\infty, 3) \cup (8, \infty)$$

3) $5x^2 + 8x + 5 \leq 2x^2 + 40$

$$3x^2 + 8x - 35 \leq 0$$

$$(3x-7)(x+5) \leq 0$$



$$[-5, \frac{7}{3}]$$

4) $|x+4| < 7$

$$x+4 < 7 \text{ and } x+4 > -7$$

$$x < 3$$

$$x > -11$$



$$(-11, 3)$$

5) $-3|x-2| + 11 \geq 6$

$$-3|x-2| \geq -5$$

$$|x-2| \leq \frac{5}{3}$$

$$x-2 \leq \frac{5}{3} \text{ and } x-2 \geq -\frac{5}{3}$$

$$x \leq \frac{11}{3}$$

$$x \geq \frac{1}{3}$$



$$[\frac{1}{3}, \frac{11}{3}]$$

6) $2|3x-7| + 17 \geq 5$

$$2|3x-7| \geq -12$$

$$|3x-7| \geq -6$$

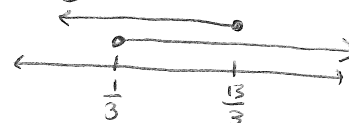
$$3x-7 \geq -6 \text{ or } 3x-7 \leq 6$$

$$3x \leq 13$$

$$3x \geq 1$$

$$x \leq \frac{13}{3}$$

$$x \geq \frac{1}{3}$$



$$(-\infty, \infty)$$

7) $\frac{3}{x-1} \leq \frac{1}{1}$

domain:

$$3 \leq x-1$$

$$x \neq 1$$

$$4 \leq x$$



$$(-\infty, 1) \cup [4, \infty)$$