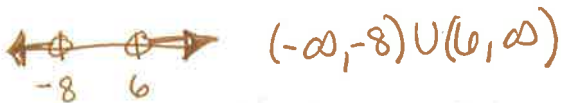


Linear & Absolute Value Inequalities

Solve each compound inequality.

1) $\frac{b}{2} < -4$ or $\frac{b}{6} > 1$

$$b < -8 \text{ or } b > 6$$



2) $\frac{x}{2} < -3$ and $x + 3 > -5$

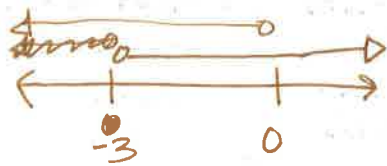
$$x < -6 \text{ and } x > -8$$



3) $8 - 10m > 8$ and $-2 + 3m > -11$

$$-10m > 0 \quad 3m > -9$$

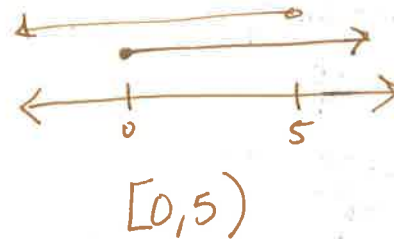
$$m < 0 \text{ and } m > -3$$



4) $-n - 3 > -8$ and $2n + 3 \geq 3$

$$-n > -5 \quad 2n \geq 0$$

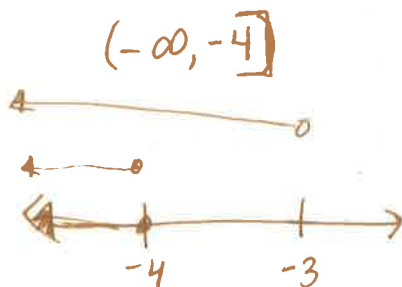
$$n < 5 \text{ and } n \geq 0$$



5) $8 - 9p \geq 44$ and $4 + 2p < -2$

$$-9p \geq 36 \quad 2p < -6$$

$$p \leq -4 \text{ and } p < -3$$



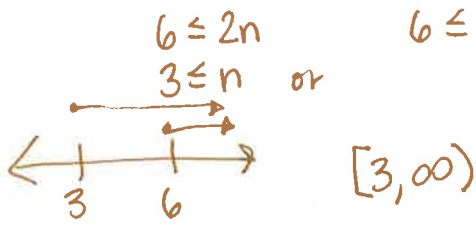
6) $-50 < 10 + 10x < 50$

$$-60 < 10x < 40$$

$$-6 < x < 4$$

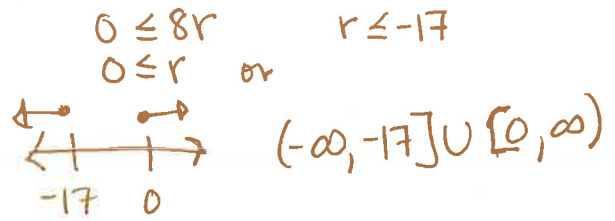
$$(-6, 4)$$

7) $2n + 8 \leq 4n + 2$ or $2n + 7 \leq 1 + 3n$



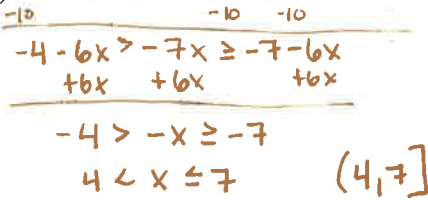
$[3, \infty)$

8) $-6r + 9 \leq 2r + 9$ or $8 + 2r \leq r - 9$

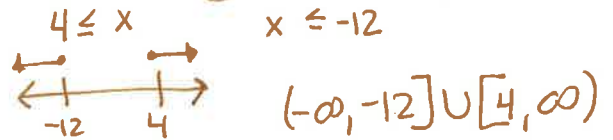


$(-\infty, -17] \cup [0, \infty)$

9) $6 - 6x > -7x + 10 \geq 3 - 6x$



10) $8 + x \leq 4 + 2x$ or $9x + 2 \leq 8x - 10$



$(-\infty, -12] \cup [4, \infty)$

11) $\frac{1}{2}x + 7x - 5 > 2x - \frac{3}{4}$ or $-7x + 3 \leq 4x + 3$

$\frac{15}{2}x - 5 > 2x - \frac{3}{4}$ $0 \leq 11x$
 $0 \leq x$

$\frac{11}{2}x > \frac{17}{4}$

$x > \frac{17}{22}$ or



$[0, \infty)$

12) $0.25(x + 5) - 7x < -8 - 6x + 6$ and $-4x + 9 - 18 > -(7x + 6)$

$0.25(x + 5) - 7x < -8 - 6x + 6$ and $-4x + 9 - 18 > -(7x + 6)$

$0.25x + 1.25 - 7x < -2 - 6x$ $-4x - 9 > -7x - 6$

$-6.75x + 1.25 < -2 - 6x$ $3x > 3$

$3.25 < 0.75x$ $x > 1$

$4.\bar{3} < x$ and



$(4.\bar{3}, \infty)$

13) $4x - 6x + 3 - \frac{1}{2} > 3(x + 2)$ and

$8x > -9x + 5 - \frac{3}{4}$

$4x - 6x + 3 - \frac{1}{2} > 3(x + 2)$ and $8x > -9x + 5 - \frac{3}{4}$

$-2x + \frac{5}{2} > 3x + 6$

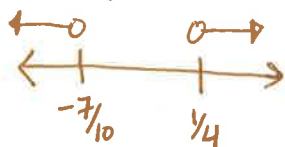
$-\frac{7}{2} > 5x$

$-\frac{7}{10} > x$ and

$8x > -9x + \frac{17}{4}$

$17x > \frac{17}{4}$

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



no solution

14) $-\frac{1}{2}(x - 7) \leq 5x - 6x - 7$ or $3x > 3x$

$-\frac{1}{2}x + \frac{7}{2} \leq -x - 7$

$\frac{1}{2}x \leq -\frac{21}{2}$

$x \leq -21$

$\frac{3x}{-3x} > \frac{3x}{-3x}$
 $0 > 0$
 False

$(-\infty, -21]$

Great OR less th AND

Solve each inequality.

15) $\left| \frac{n}{9} \right| < -2$

no solution

absolute values
are always +

16) $\left| \frac{m}{9} \right| > 4$

$(-\infty, -36) \cup (36, \infty)$

$\frac{m}{9} > 4$ or $\frac{m}{9} < -4$
 $m > 36$ or $m < -36$

17) $-10|-8v| \leq -80$

$|-8v| \geq 8$

$-8v \geq 8$ or $-8v \leq -8$

$v \leq -1$ or $v \geq 1$

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

18) $|-10n| - 8 < 42$

$|-10n| < 50$

$-50 < -10n < 50$

$5 > n > -5$

$(-5, 5)$

19) $5\left| \frac{n}{6} \right| - 1 > -11$

$5\left| \frac{n}{6} \right| > -10$

$\left| \frac{n}{6} \right| > -2$

\mathbb{R}

always +

20) $4\left| \frac{a}{8} \right| - 10 \geq -8$

$4\left| \frac{a}{8} \right| \geq 2$

$\left| \frac{a}{8} \right| \geq \frac{1}{2}$

$\frac{a}{8} \geq \frac{1}{2}$ or $\frac{a}{8} \leq -\frac{1}{2}$

$a \geq 4$ or $a \leq -4$

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

21) $7 - 2|x - 1| \leq -3$

$-2|x - 1| \leq -10$

$|x - 1| \geq 5$

$x - 1 \geq 5$ or $x - 1 \leq -5$

$x \geq 6$ or $x \leq -4$

$(-\infty, -4] \cup [6, \infty)$

22) $3\left| \frac{x}{9} \right| - 1 < -3$

$3\left| \frac{x}{9} \right| < -2$

$\left| \frac{x}{9} \right| < -\frac{2}{3}$

no solution

$$23) |-1 + 9x| < 62$$

$$-62 < -1 + 9x < 62$$

$$-61 < 9x < 63$$

$$-\frac{61}{9} < x < 7$$

$$\left(-\frac{61}{9}, 7\right)$$

$$24) |-7p + 3| < 18$$

$$-18 < -7p + 3 < 18$$

$$-21 < -7p < 15$$

$$3 > p > \frac{-15}{7}$$

$$\left(\frac{-15}{7}, 3\right)$$

$$25) \frac{|4 - 6a|}{8} > -1$$

$$|4 - 6a| > -8$$

\mathbb{R}

$$26) |-a - 5| + 10 \geq 12$$

$$|-a - 5| \geq 2$$

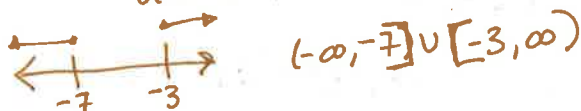
$$-a - 5 \geq 2 \quad \text{or} \quad -a - 5 \leq -2$$

$$-a \geq 7$$

$$-a \leq 3$$

$$a \leq -7$$

$$a \geq -3$$



$$27) 10|-8p + 1| - 8 \geq 82$$

$$10|-8p + 1| \geq 90$$

$$|-8p + 1| \geq 9$$

$$-8p + 1 \geq 9 \quad \text{or} \quad -8p + 1 \leq -9$$

$$-8p \geq 8$$

$$-8p \leq -10$$

$$p \leq -1$$

$$p \geq \frac{5}{4}$$



$$(-\infty, -1] \cup [5/4, \infty)$$

$$28) -1 - 6|3n - 6| \geq -55$$

$$-6|3n - 6| \geq -54$$

$$|3n - 6| \leq 9$$

$$-9 \leq 3n - 6 \leq 9$$

$$-3 \leq 3n \leq 15$$

$$-1 \leq n \leq 5$$

$$[-1, 5]$$

$$29) 8|n + 7| + 10 \geq 90$$

$$8|n + 7| \geq 80$$

$$|n + 7| \geq 10$$

$$n + 7 \geq 10 \quad \text{or} \quad n + 7 \leq -10$$

$$n \geq 3 \quad \text{or} \quad n \leq -17$$

$$(-\infty, -17] \cup [3, \infty)$$

$$30) 6|4 + 7x| - 8 \geq 16$$

$$6|4 + 7x| \geq 24$$

$$|4 + 7x| \geq 4$$

$$4 + 7x \geq 4 \quad \text{or} \quad 4 + 7x \leq -4$$

$$7x \geq 0$$

$$7x \leq -8$$

$$x \geq 0$$

$$x \leq -8/7$$

$$(-\infty, -8/7] \cup [0, \infty)$$

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Solve each compound inequality.

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$$25) \quad \frac{|4 - 6a|}{8} > -1$$

$$26) \quad |-a - 5| + 10 \geq 12$$

$$27) \quad 10|-8p + 1| - 8 \geq 82$$

$$28) \quad -1 - 6|3n - 6| \geq -55$$

$$29) \quad 8|n + 7| + 10 \geq 90$$

$$30) \quad 6|4 + 7x| - 8 \geq 16$$