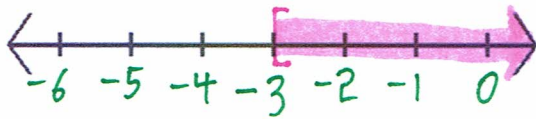


1) $-20 \leq 1 + 7x$

$$\begin{array}{r} -1 \quad -1 \\ \hline -21 \leq 7x \\ \hline \end{array}$$

$$-3 \leq x$$



$$[-3, \infty)$$

(number lines courtesy of
Math Warehouse.com)

4) $-\frac{7}{6} \cdot -\frac{18}{1} < -\frac{6}{7}k \cdot -\frac{7}{6}$

$$21 > k$$

Whenever you multiply or divide
by a negative number you must
reverse or "flip" the inequality sign.



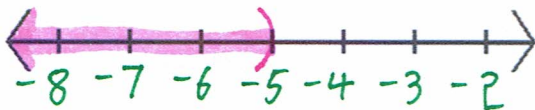
$$(-\infty, 21)$$

2) $6r + 7 < 4r - 3$

$$\begin{array}{r} -4r \quad -4r \\ \hline 2r + 7 < -3 \\ \hline \end{array}$$

$$\begin{array}{r} -7 \quad -7 \\ \hline 2r < -10 \\ \hline \end{array}$$

$$r < -5$$



$$(-\infty, -5)$$

3) $6(k - 2) + 8k < 4(3k + 1)$

$$6k - 12 + 8k < 12k + 4$$

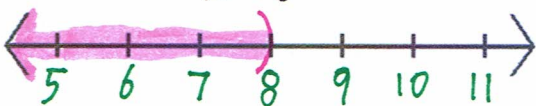
$$14k - 12 < 12k + 4$$

$$\begin{array}{r} -12k \quad -12k \\ \hline \end{array}$$

$$\begin{array}{r} 2k - 12 < 4 \\ \hline +12 \quad +12 \\ \hline \end{array}$$

$$\begin{array}{r} 2k < 16 \\ \hline \end{array}$$

$$k < 8$$



$$(-\infty, 8)$$

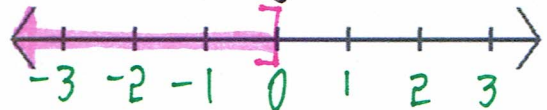
5) $13x - 6 + 9x \leq 2 + 10x - 8$

$$\begin{array}{r} 22x - 6 \leq -6 + 10x \\ -10x \quad -10x \\ \hline \end{array}$$

$$\begin{array}{r} 12x - 6 \leq -6 \\ +6 \quad +6 \\ \hline \end{array}$$

$$\begin{array}{r} 12x \leq 0 \\ \hline \end{array}$$

$$x \leq 0$$



$$(-\infty, 0]$$

6) $7(2n - 3) + 5 \geq 8n - 4$

$$14n - 21 + 5 \geq 8n - 4$$

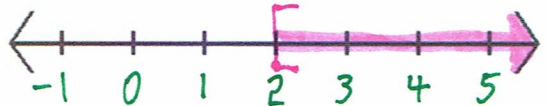
$$14n - 16 \geq 8n - 4$$

$$\begin{array}{r} -8n \quad -8n \\ \hline \end{array}$$

$$\begin{array}{r} 6n - 16 \geq -4 \\ +16 \quad +16 \\ \hline \end{array}$$

$$\begin{array}{r} 6n \geq 12 \\ \hline \end{array}$$

$$n \geq 2$$



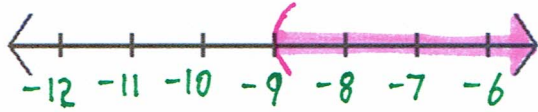
$$[2, \infty)$$

7) $-8y < 45 - 3y$

$$\begin{array}{r} +3y \\ -8y < 45 - 3y \\ \hline -5y < 45 \end{array}$$

$$\begin{array}{r} -5y < 45 \\ -5 \quad -5 \\ \hline y > -9 \end{array}$$

Whenever you multiply or divide by a negative number you must reverse or "flip" the inequality sign.

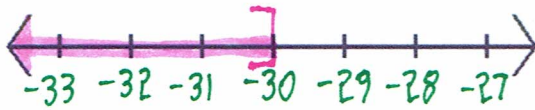


$$(-9, \infty)$$

8) $7 + 10x \leq 4x - 23 + 5x$

$$\begin{array}{r} 7 + 10x \leq 4x - 23 + 5x \\ -9x \quad -9x \\ \hline 7 + x \leq -23 \end{array}$$

$$\begin{array}{r} 7 + x \leq -23 \\ -7 \quad -7 \\ \hline x \leq -30 \end{array}$$



$$(-\infty, -30]$$

9) $5 - 3(r - 2) \geq 7(5 - 4r) + r$

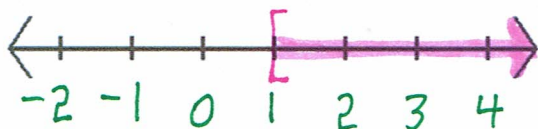
$$5 - 3r + 6 \geq 35 - 28r + r$$

$$\begin{array}{r} 11 - 3r \geq 35 - 27r \\ +27r \quad +27r \\ \hline 11 + 24r \geq 35 \end{array}$$

$$\begin{array}{r} 11 + 24r \geq 35 \\ -11 \quad -11 \\ \hline 24r \geq 24 \end{array}$$

$$\begin{array}{r} 24r \geq 24 \\ 24 \quad 24 \\ \hline r \geq 1 \end{array}$$

$$r \geq 1$$

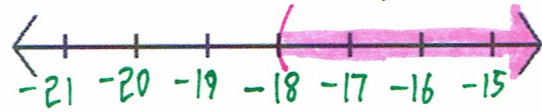


$$[1, \infty)$$

10) $-\frac{3}{2} \cdot -\frac{2}{3}y < \frac{12}{1} \cdot -\frac{3}{1 \cdot 2}$

$$y > -18$$

Whenever you multiply or divide by a negative number you must reverse or "flip" the inequality sign.



$$(-18, \infty)$$

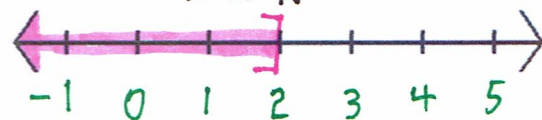
11) $11 - 10k + 9 \geq 2k + 12 - 8k$

$$\begin{array}{r} 20 - 10k \geq -6k + 12 \\ +10k \quad +10k \\ \hline 20 \geq 4k + 12 \end{array}$$

$$\begin{array}{r} 20 \geq 4k + 12 \\ -12 \quad -12 \\ \hline 8 \geq 4k \end{array}$$

$$\begin{array}{r} 8 \geq 4k \\ 4 \quad 4 \\ \hline 2 \geq k \end{array}$$

$$2 \geq k$$



$$(-\infty, 2]$$

$$\begin{array}{r} 20 - 10k \geq -6k + 12 \\ +6k \quad +6k \\ \hline 20 - 4k \geq 12 \end{array}$$

$$\begin{array}{r} 20 - 4k \geq 12 \\ -20 \quad -20 \\ \hline -4k \geq -8 \end{array}$$

$$\begin{array}{r} -4k \geq -8 \\ -4 \quad -4 \\ \hline k \leq 2 \end{array}$$

$$k \leq 2$$

12) $4x + 5(3x - 8) - 1 > 10x + 31$

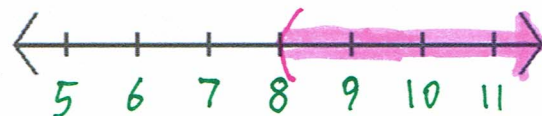
$$4x + 15x - 40 - 1 > 10x + 31$$

$$\begin{array}{r} 19x - 41 > 10x + 31 \\ -10x \quad -10x \\ \hline 9x - 41 > 31 \end{array}$$

$$\begin{array}{r} 9x - 41 > 31 \\ +41 \quad +41 \\ \hline 9x > 72 \end{array}$$

$$\begin{array}{r} 9x > 72 \\ 9 \quad 9 \\ \hline x > 8 \end{array}$$

$$x > 8$$



$$(8, \infty)$$