

## A-2 SOLVING INEQUALITIES

The key for solving inequalities is

to switch (reverse) the  $>$ ,  $<$ ,  $\geq$  or  $\leq$

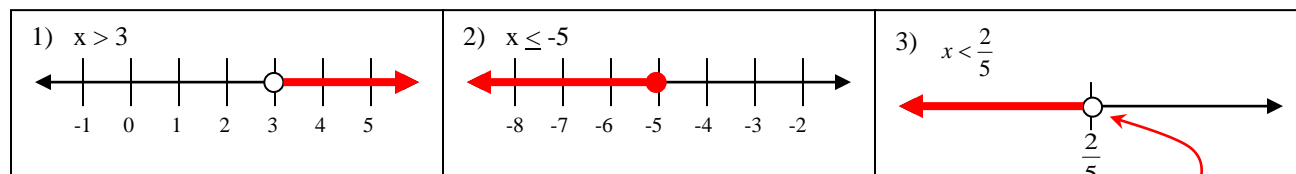
when dividing (or mult.) by a negative

Find the mistake(s) in the work for the inequality.

$$\begin{aligned} 3(2 - x) &> -12 \\ 6 - 3x &> -12 \\ -3x &> -18 \\ x &> 6 \end{aligned}$$

The  $>$  needed to be switched to a  $<$

Graph each inequality on the number line provided.



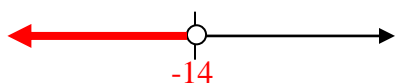
Since #-line is understood to be infinite, you can be "lazy" and just put one grid mark.

Examples:

Solve each inequality, then graph the solution set on a number line.

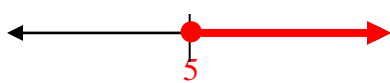
4)  $2w + 15 < -13$

$$\begin{aligned} 2w &< -28 \\ w &< -14 \\ \text{do not switch (divided} \\ &\text{by positive 2)} \end{aligned}$$



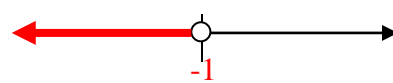
5)  $-22 \geq 3 - 5n$

$$\begin{aligned} -25 &\geq -5n \\ 5 &\leq n \\ n &\geq 5 \\ \text{flip the final answer so} \\ &\text{the variable is first} \end{aligned}$$



6)  $\frac{3r - 4}{7} > r$

$$\begin{aligned} 3r - 4 &> 7r \\ -4 &> 4r \\ -1 &> r \\ r &< -1 \end{aligned}$$



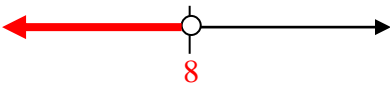
7)  $6 - (2x + 7) \geq 9$

$$\begin{aligned} 6 - 2x - 7 &\geq 9 \\ -2x - 1 &\geq 9 \\ -2x &\geq 10 \\ x &\leq -5 \end{aligned}$$



8)  $\frac{2}{5} + \frac{x}{10} < \frac{6}{5}$

$$\begin{aligned} \frac{4}{10} + \frac{x}{10} &< \frac{12}{10} \\ 4 + x &< 12 \\ x &< 8 \end{aligned}$$



9)  $3a > 4(a - 2) - a$

$$\begin{aligned} 3a &> 4a - 8 - a \\ 3a &> 3a - 8 \\ 0 &> -8 \\ \text{*true statement, thus:} \\ \text{answer: infinite solutions} \end{aligned}$$



10) Jim is selling advertising space in *Math Unlimited Magazine* to local businesses. Jim earns 5% commission for every advertisement he sells plus a salary of \$350 per week. If the average amount of money that a business will spend on an advertisement is \$500, how many advertisements must he sell each week to make a salary of at least \$1000?

Let  $x$  = the number of advertisements sold.

$500x$  would equal money received for several sales.

$.05(500x)$  would equal Jim's share (or commission).

$.05(500x) + 350$  equals Jim's commission plus weekly salary.

$.05(500x) + 350 \geq 1000$  would net Jim at least 1000 bucks.

Solve:

$$25x + 350 \geq 1000$$
$$25x \geq 650$$
$$x \geq 26$$

Jim must sell at least 26 ads to make \$1000/week