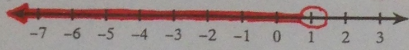


Solving & Graphing Inequalities - NOTES

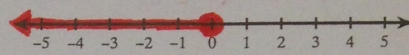
Solve each inequality and graph its solution.

1) $8(4 - 8a) > -35 + 3a$



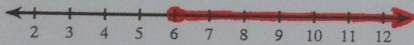
$$\begin{aligned} 8(4 - 8a) &> -35 + 3a \\ 32 - 64a &> -35 + 3a \\ +64a & \quad +64a \\ 32 &> -35 + 67a \\ +35 & \quad +35 \\ 67 &> 67a \\ \frac{67}{67} & \quad \frac{67}{67} \\ 1 &> a \\ \boxed{1 > a} \end{aligned}$$

2) $-35 - 5r \geq -7(5 - 8r)$



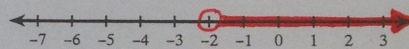
$$\begin{aligned} -35 - 5r &\geq -35 + 56r \\ +35 & \quad +35 \\ -5r &\geq 56r \\ +5r & \quad +5r \\ 0 &\geq 61r \\ \frac{0}{61} & \quad \frac{61r}{61} \\ 0 &\geq r \\ \boxed{0 \geq r} \end{aligned}$$

3) $-4(m + 6) + 3m \geq -8m + 18$



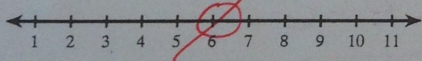
$$\begin{aligned} -4m - 24 + 3m &\geq -8m + 18 \\ -24 - m &\geq -8m + 18 \\ +8m & \quad +8m \\ -24 + 7m &\geq 18 \\ +24 & \quad +24 \\ 7m &\geq 42 \\ \frac{7m}{7} & \quad \frac{42}{7} \\ m &\geq 6 \\ \boxed{m \geq 6} \end{aligned}$$

4) $-6v - 16 > 4(-3v - 7)$



$$\begin{aligned} -6v - 16 &> -12v - 28 \\ +12v & \quad +12v \\ 6v - 16 &> -28 \\ +16 & \quad +16 \\ 6v &> -12 \\ \frac{6v}{6} & \quad \frac{-12}{6} \\ v &> -2 \\ \boxed{v > -2} \end{aligned}$$

5) $20 + 2m \leq 2(m + 6)$

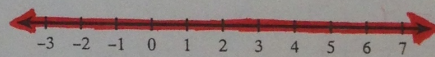


$$\begin{aligned} 20 + 2m &\leq 2m + 12 \\ -2m & \quad -2m \\ 20 &\leq 12 \end{aligned}$$

FALSE STATEMENT.

 $\boxed{\text{NO SOLUTION.}}$

6) $8x \leq -(-8x - 5)$



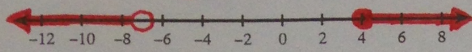
$$\begin{aligned} 8x &\leq 8x + 5 \\ -8x & \quad -8x \\ 0 &\leq 5 \end{aligned}$$

TRUE STATEMENT.

 $\boxed{\text{INFINITE SOLUTIONS}}$

Solve each compound inequality and graph its solution.

7) $8 + 4r \geq 24$ or $-1 + 7r < -50$



$$\begin{aligned} 8 + 4r &\geq 24 \\ -8 &\quad -8 \\ \hline 4r &\geq 16 \\ \frac{4r}{4} &\geq \frac{16}{4} \end{aligned}$$

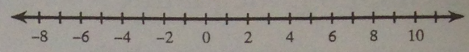
$$r \geq 4$$

$$\begin{aligned} -1 + 7r &< -50 \\ +1 &\quad +1 \\ \hline 7r &< -49 \\ \frac{7r}{7} &< \frac{-49}{7} \end{aligned}$$

$$r < -7$$

OR

8) $-6n + 9 < -33$ or $3n - 9 \leq -18$



$$\begin{aligned} -6n + 9 &< -33 \\ -9 &\quad -9 \\ \hline -6n &< -42 \\ \frac{-6n}{-6} &< \frac{-42}{-6} \end{aligned}$$

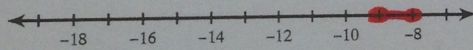
$$n > 7$$

$$\begin{aligned} 3n - 9 &\leq -18 \\ +9 &\quad +9 \\ \hline 3n &\leq -9 \\ \frac{3n}{3} &\leq \frac{-9}{3} \end{aligned}$$

$$n \leq -3$$

WHEN YOU DIVIDE BY A NEGATIVE, YOU HAVE TO FLIP THE SIGN.

9) $2 \leq -6 - n \leq 3$



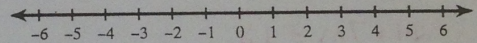
$$\begin{aligned} 2 &\leq -6 - n \leq 3 \\ +6 &\quad +6 \quad +6 \end{aligned}$$

$$\begin{aligned} 8 &\leq -n \leq 9 \\ \frac{8}{-1} &\leq \frac{-n}{-1} \leq \frac{9}{-1} \end{aligned}$$

$$-8 \geq n \geq -9$$

FLIP SIGN!

10) $-18 \leq 4n - 10 \leq -34$



$$\begin{aligned} -18 &\leq 4n - 10 \leq -34 \\ +10 &\quad +10 \quad +10 \end{aligned}$$

$$\begin{aligned} -8 &\leq 4n \leq -24 \\ \frac{-8}{4} &\leq \frac{4n}{4} \leq \frac{-24}{4} \end{aligned}$$

$$-2 \leq n \leq -6$$

THIS DOES NOT MAKE SENSE. A NUMBER CAN'T BE LARGER THAN -2 AND SMALLER THAN -6.

NO SOLUTION