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Solutions

- (1) Solve for x in the proportion. Use only the property of proportions (about the means and extremes). $\frac{x+3}{12} = \frac{-7}{6}$

Solutions.

The property says that the product of the extremes equals the product of the means:

$$\begin{aligned} \frac{x+3}{12} = \frac{-7}{6} &\Rightarrow 6(x+3) = -7 \cdot 12 \Rightarrow 6x + 18 = -84 \Rightarrow 6x = -84 - 18 \Rightarrow \\ &\Rightarrow 6x = -102 \Rightarrow \frac{6x}{6} = \frac{-102}{6} \Rightarrow \boxed{x = -17} . \end{aligned}$$

The solution is $x = -17$. ■

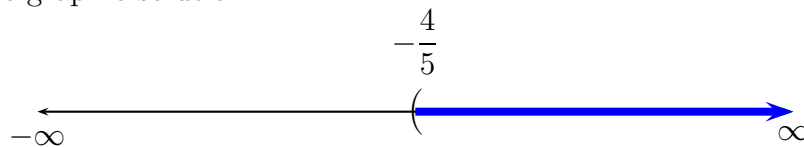
- (2) Solve the inequality. Graphic and interval solutions, please. $-4(y-1) < y+8$

Solutions.

Distribute, reduce terms, and keep in mind what happens if you divide inequalities by negative numbers.

$$-4(y-1) < y+8 \Rightarrow \underbrace{-4y+4 < y+8}_{\text{subtract 4}} \Rightarrow \underbrace{-4y < y+4}_{\text{subtract } y} \Rightarrow -5y < 4 \Rightarrow \frac{-5y}{-5} > \frac{4}{-5} \Rightarrow y > -\frac{4}{5}$$

Here is the graphic solution:



Here is the interval solution: $y \in \left(-\frac{4}{5}, \infty\right)$. ■

- (3) Solve the equality. $|2-x|+3=5$

Solutions.

Subtract 3 from both sides: $|2-x|+3=5 \Rightarrow |2-x|=2$. Then

$$|2-x|=2 \Rightarrow 2-x=2 \text{ or } 2-x=-2$$

Solve the first, by subtracting 2 from both sides:

$$2-x=2 \Rightarrow -x=0 / \cdot (-1) \Rightarrow \boxed{x=0} .$$

Solve the second, by subtracting 2 from both sides:

$$2-x=-2 \Rightarrow -x=-4 / \cdot (-1) \Rightarrow \boxed{x=4} .$$

The solutions are $x=0$ and $x=-4$ (checked them). ■