

ALGEBRA 1
CHAPTER 3 REVIEW

Name KEY
Date _____

Determine if the given value makes the inequality true or false.

1. $-5x + 7 \geq 15$; $x = -2$

$$\begin{aligned} -5(-2) + 7 &\stackrel{?}{\geq} 15 \\ 10 + 7 &\stackrel{?}{\geq} 15 \\ 17 &\geq 15 \\ \text{TRUE} \end{aligned}$$

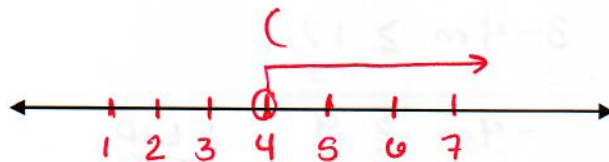
2. $\frac{8-3m}{4} < 0$; $m = 2$

$$\begin{aligned} \frac{8-3(2)}{4} &\stackrel{?}{<} 0 \\ \frac{8-6}{4} &\stackrel{?}{<} 0 \\ \frac{2}{4} &\stackrel{?}{<} 0 \\ \frac{1}{2} &< 0; \text{ FALSE} \end{aligned}$$

Solve and graph each inequality.

3. $\frac{12}{-8} < \frac{n+8}{-8}$

$$\begin{aligned} 4 &< n \\ n &> 4 \end{aligned}$$



4. $-3\left(-\frac{x}{3}\right) \geq (-12)$

$$x \leq 36 \quad \text{FLIP}$$

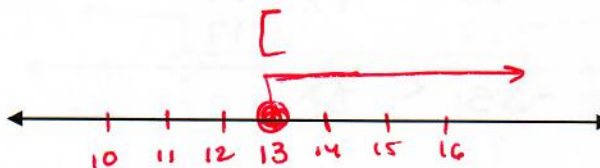


5. $\frac{2a-16}{5} \geq (2)$

$$\frac{2a-16}{5} \geq 2$$

$$\frac{2a}{2} \geq \frac{26}{2}$$

$$a \geq 13$$



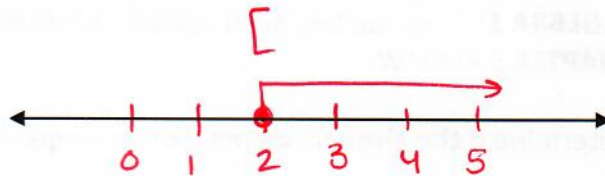
Solve and graph each inequality.

$$6. \quad \frac{3}{2} \leq \frac{x}{4} + 1$$

$$\frac{6}{-4} \leq \frac{x}{-4} + \frac{4}{-4}$$

$$2 \leq x$$

$$x \geq 2$$

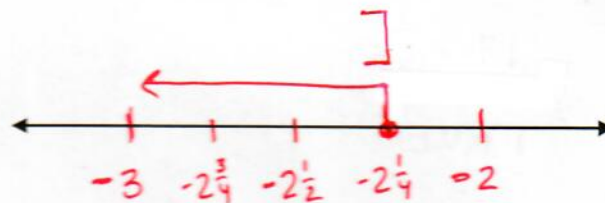


$$7. \quad \frac{3-4m}{2} \geq 6$$

$$\frac{3-4m}{-3} \geq \frac{12}{-3}$$

$$\frac{-4m}{-4} \geq \frac{9}{-4} \quad \text{FLIP}$$

$$m \leq -\frac{9}{4} \text{ or } -2\frac{1}{4}$$



$$8. \quad 3(-x-6) < 2(2x+8)+1$$

$$-3x-18 < 4x+16+1$$

$$-3x-18 < 4x+17$$

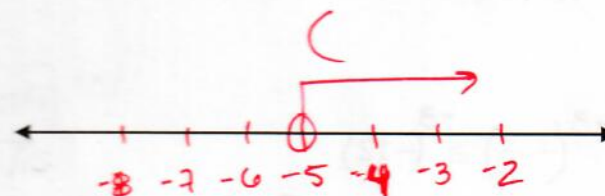
$$\frac{-35}{7} < \frac{7x}{7}$$

$$\frac{-18}{-17} < \frac{7x+17}{-17}$$

$$\frac{-35}{7} < \frac{7x}{7}$$

$$-5 < x$$

$$x > -5$$

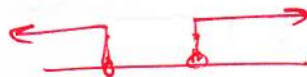


9. Explain the difference between an "and" compound inequality versus an "or" compound inequality.

AND come together



OR go apart



* not a technical explanation

Solve each compound inequality and graph the solution set.

10. $2 + 3x > 8$ or $4 - 7x \geq -17$

-2 -2 -4 -4

apart

$$\frac{3x > 6}{3} > \frac{6}{3}$$

$$x > 2$$

$$\frac{-7x \geq -21}{-7} \geq \frac{-21}{-7}$$

$$x \leq 3 \text{ FLIP}$$

All \mathbb{R}

11. $1 \leq \frac{2y+3}{4} < 3$

$1 \leq \frac{2y+3}{4}$ AND $\frac{2y+3}{4} < 3$

$$4 \leq 2y+3$$

$$1 \leq 2y$$

$$\frac{1}{2} \leq y$$

$$y \geq \frac{1}{2}$$

$$2y+3 < 12$$

$$2y < 9$$

$$y < \frac{9}{2} \text{ or } 4\frac{1}{2}$$

12. $|-4x+8| \leq 16$

$-4x+8 \leq 16$ and $-4x+8 \geq -16$

$$\frac{-4x \leq 8}{-4} \geq \frac{8}{-4}$$

$$x \geq -2 \text{ FLIP}$$

$$\frac{-4x \geq -24}{-4} \leq \frac{-24}{-4}$$

$$x \leq 6 \text{ FLIP}$$

13. $\left| \frac{3-2x}{5} \right| > 1$

$\frac{3-2x}{5} > 1$ OR $\frac{3-2x}{5} < -1$

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

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

$$\text{FLIP } x < -1$$

$$\frac{3-2x < -5}{-3} < \frac{-5}{-3}$$

$$\frac{-2x < -8}{-2} < \frac{-8}{-2}$$

$$x > 4 \text{ FLIP}$$

For each word problem, define a variable, write an inequality, solve and answer in a sentence.

14. Juan want to buy two shirts and a pair of jeans. Each shirt costs \$18.50.
If Juan wants to spend at most \$78, how much can he spend on a pair of jeans.

let j = amount he can spend on a pair of jeans

$$\text{Two shirts} + \text{jeans} \leq 78$$

$$2(18.50) + j \leq 78$$

$$37 + j \leq 78$$

$$\begin{array}{r} 37 \\ -37 \end{array} \quad \begin{array}{r} + j \\ \\ -37 \end{array} \leq 78$$

$$j \leq 41$$

He can spend at most \$41 on a pair of jeans

15. A farmer wants to enclose a large rectangular plot of land for a garden. He wants the perimeter of the garden to be at least 200 feet. He also would like the length of the garden to be 40 feet more than twice the width. What are the minimum dimensions that the farmer should consider?

$$\boxed{P \geq 200 \text{ ft}} \quad W$$

$$2w + 40$$

let w = width of the garden

$$P \geq 200 \text{ ft}$$

$$2l + 2w \geq 200$$

$$2(2w+40) + 2w \geq 200$$

$$4w + 80 + 2w \geq 200$$

$$\begin{array}{r} 6w + 80 \\ -80 \end{array} \geq \begin{array}{r} 200 \\ -80 \end{array}$$

$$\frac{6w}{6} \geq \frac{120}{6}$$

$$w \geq 20$$

$$\therefore \text{length} \geq 2w + 40$$

$$\text{length} \geq 2(20) + 40$$

$$\text{length} \geq 80$$

The length should be at least 80 ft and the width at least 20 ft.