

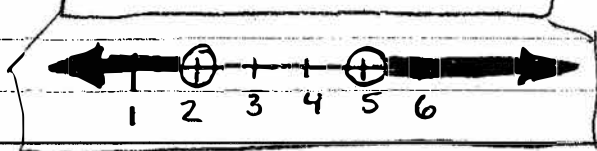
Chapter 1-6 Solving Compound & Absolute Value Inequalities

Solve each inequality. Graph the solution set on a number line.

(54) $4x + 3 < 11$ or $2x - 1 > 9$

$$\begin{array}{r} -3 \quad -3 \\ \hline 4x < 8 \\ \hline 4 \quad 4 \end{array} \quad \begin{array}{r} +1 \quad +1 \\ \hline 2x > 10 \\ \hline 2 \quad 2 \end{array}$$

$$x < 2 \quad \text{or} \quad x > 5$$



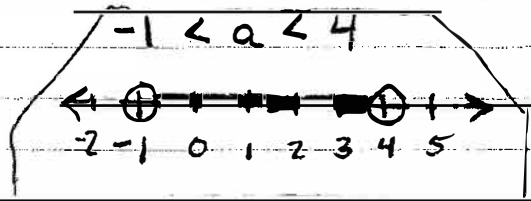
Students Need to Know....

Inequalities joined by "and", "or" are called compound inequalities.
 "and": solutions make BOTH true
 "or": solutions make either true

(55) $-1 < 3a + 2 < 14$

$$\begin{array}{r} -2 \quad -2 \quad -2 \\ \hline -3 < 3a < 12 \\ \hline 3 \quad 3 \quad 3 \end{array}$$

$$-1 < a < 4$$



← Inequalities like this are "and"
 "-1 < a < 4" is the same as "a > -1 and a < 4"

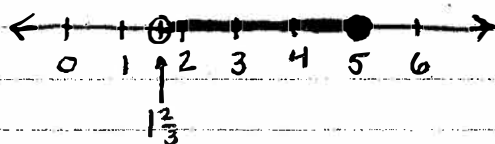
(56) $-1 < 3(d-2) \leq 9$

$$-1 < 3d - 6 \leq 9$$

$$\begin{array}{r} +6 \quad +6 \quad +6 \\ \hline 5 < 3d \leq 15 \\ \hline 3 \quad 3 \quad 3 \end{array}$$

$$\frac{5}{3} < d \leq 5$$

$$1\frac{2}{3} < d \leq 5$$

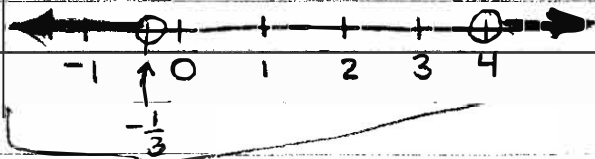


← ○ → <
 >
 ↑ open circle
 (doesn't include)

← ● → ≥, ≤
 ↑ closed circle
 (does include)

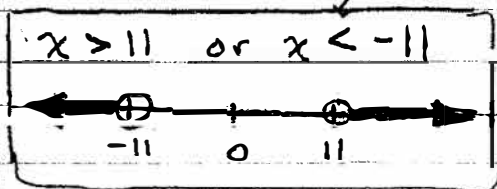
Chapter 1.6 continued

$$\begin{array}{lcl} \textcircled{57} & 5y - 4 > 16 & \text{or } 3y + 2 < 1 \\ & \underline{+4} \quad \underline{+4} & \downarrow \quad \downarrow \\ & 5y > 20 & \text{or } 3y < -1 \\ & \underline{} \quad \underline{} & \downarrow \quad \downarrow \\ & y > 4 & \text{or } y < -\frac{1}{3} \end{array}$$



$$\begin{array}{l} \textcircled{58} \quad |x| + 1 > 12 \\ \underline{-1} \quad \underline{-1} \\ |x| > 11 \end{array}$$

$$x > 11 \quad \text{or} \quad \frac{-x}{-1} > \frac{11}{-1}$$



$$\textcircled{59} \quad |2y - 9| \leq 27$$

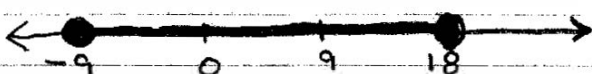
$$2y - 9 \leq 27 \quad \text{and} \quad \frac{-(2y - 9)}{-1} \leq \frac{27}{-1}$$

$$2y - 9 \leq 27 \quad \text{and} \quad 2y - 9 \geq -27$$

$$\underline{+9} \quad \underline{+9} \quad \text{and} \quad \underline{+9} \quad \underline{+9}$$

$$\frac{2y}{2} \leq \frac{36}{2} \quad \text{and} \quad \frac{2y}{2} \geq \frac{-18}{2}$$

$$y \leq 18 \quad \text{and} \quad y \geq -9$$



Absolute Value Inequalities;

① Isolate Abs. Val.

② Write two inequalities

↓ "expression" ↓ "opposite of expression"

$$| \text{Abs. Val.} | > \quad \uparrow \quad \text{"AND"}$$

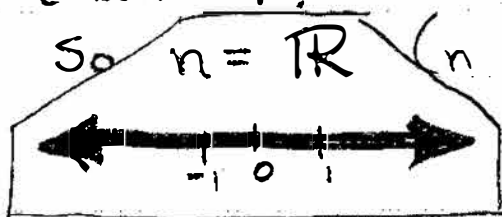
$$| \text{Abs. Val.} | < \quad \uparrow \quad \text{"OR"}$$

Chapter 1.6 continued

60) $|5n - 8| > -4$

Since Absolute Values
are always positive, then
 $|5n - 8|$ is always greater
than -4 .

So $n = \mathbb{R}$ (n can be all Real Numbers)



61) $|3b + 11| > 1$

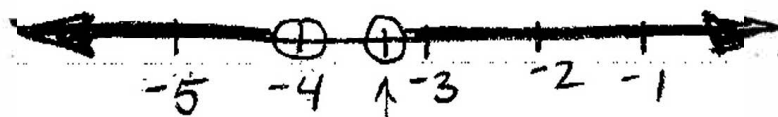
$$3b + 11 > 1 \quad \text{or} \quad -(3b + 11) > 1$$

$$\underline{3b + 11} > \underline{1} \quad \text{or} \quad \underline{3b + 11} < \underline{-1}$$

$$\underline{\underline{3b}} > \underline{\underline{-10}} \quad \text{or} \quad \underline{\underline{3b}} < \underline{\underline{-12}}$$

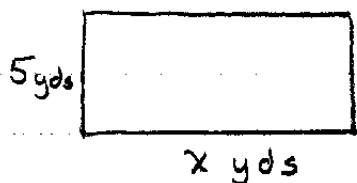
$$b > -\frac{10}{3} \quad \text{or} \quad b < -4$$

$$b > -3\frac{1}{3} \quad \text{or} \quad b < -4$$



Chapter 1-6 continued

⑥2 Don is building a fence around a rectangular plot and wants the perimeter to be between 17 and 20 yards. The width of the plot is 5 yards. Write and solve a compound inequality to describe the range of possible measures for the length of the fence.



$$P = 5 + x + 5 + x$$

$$P = 5 + 5 + x + x$$

$$P = 10 + 2x$$

$$17 < 10 + 2x < 20$$
$$\begin{array}{ccc} \underline{-10} & \underline{-10} & \underline{-10} \end{array}$$

$$\frac{7}{2} < \frac{2x}{2} < \frac{10}{2}$$

$$\frac{7}{2} < x < 5$$

$$3.5 < x < 5$$

The length of the fence
can be between 3.5 ft and 5 ft

Assignment 1.6
Solving Compound and Absolute Value Inequalities

Solve each inequality. Graph the solution set on a number line.

$8 \div 4 =$

A) 2
B) -2

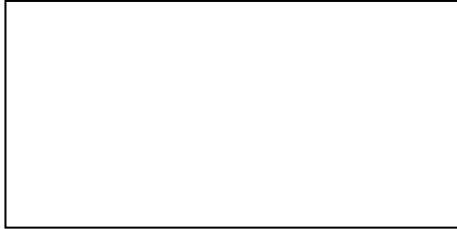
$$\begin{aligned} 4x + 3 &< 11 \\ 4x - 3 &< 11 - 3 \\ \frac{4x}{4} &< \frac{8}{4} \end{aligned}$$

or

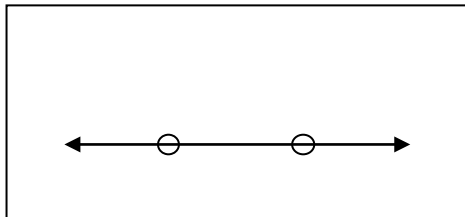
$$\begin{aligned} 2x - 1 &> 9 \\ 2x + 1 &> 9 + 1 \\ \frac{2x}{2} &> \frac{10}{2} \end{aligned}$$

$10 \div 2 =$

A) -5
B) 5



$$\begin{aligned} -1 &< 3a + 2 < 14 \\ \frac{-2}{3} &\frac{-2}{3} \quad \frac{-2}{3} \\ \frac{-3}{3} &< \frac{3a}{3} < \frac{12}{3} \end{aligned}$$



$-3 \div 3 =$

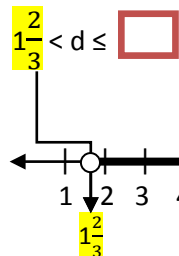
A) 1
B) -1

$12 \div 3 =$

A) -4
B) 4

$$\begin{aligned} -1 &< 3(d - 2) \leq 9 \\ -1 &< 3d - 6 \leq 9 \\ \frac{+6}{3} &\frac{+6}{3} \quad \frac{+6}{3} \\ \frac{5}{3} &< \frac{3d}{3} \leq \frac{15}{3} \end{aligned}$$

$1\frac{2}{3} < d \leq 5$



$15 \div 3 =$

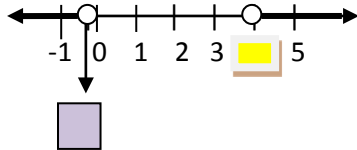
A)
B)

Assignment 1.6
Solving Compound and Absolute Value Inequalities

$$\begin{array}{lcl}
 5y - 4 > 16 & \text{or} & 3y + 2 < 1 \\
 \underline{+4} \quad \underline{+4} & \downarrow & \underline{-2} \quad \underline{-2} \\
 \frac{5y}{5} > \frac{20}{5} & \text{or} & \frac{3y}{3} < \frac{-1}{3} \\
 y > \boxed{} & \text{or} & y < \boxed{}
 \end{array}$$

$$20 \div 5 = \boxed{}$$

- A) 4
B) 5



$$\begin{array}{l}
 |x| + 1 > 12 \\
 \underline{-1} \quad \underline{-1} \\
 |x| > 11
 \end{array}$$

$$x > 11 \quad \text{or} \quad \frac{-x}{-1} > \frac{11}{-1}$$

$$x > 11 \quad \text{or} \quad x < \boxed{}$$

$$11 \div -1 = \boxed{}$$

- A) 11
B) -11



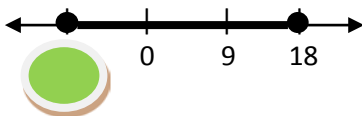
$$|2y - 9| \leq 27$$

$$2y - 9 \leq 27 \quad \text{and} \quad \frac{-(2y - 9)}{-1} \leq \frac{27}{-1}$$

$$\begin{array}{lcl}
 2y - 9 \leq 27 & \text{and} & 2y - 9 \geq -27 \\
 \underline{+9} \quad \underline{+9} & & \underline{+9} \quad \underline{+9} \\
 \frac{2y}{2} \leq \frac{36}{2} & & \frac{2y}{2} \geq \frac{-18}{2} \\
 y \leq 18 & & y \geq \boxed{}
 \end{array}$$

$$-18 \div 2 = \boxed{}$$

- A) -9
B) 9

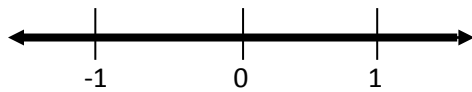


Assignment 1.6
Solving Compound and Absolute Value Inequalities

$$|5n - 8| > -4$$

Since Absolute Values are always positive, then $|5n - 8|$ is always greater than -4 .

So $n = \mathbb{R}$ (n can be all Real Numbers)



Is this correct?

YES

NO

$$|3b + 11| > 1$$

$$3b + 11 > 1 \quad \text{or} \quad \frac{-(3b + 11)}{-1} > \frac{1}{-1}$$

$$-10 \div 3 = \boxed{}$$

A) $-3 \frac{1}{3}$

B) $3 \frac{1}{3}$

$$\begin{array}{r} 3b + 11 > 1 \\ \underline{-11} \quad \underline{-11} \\ \frac{3b}{3} \quad \frac{-10}{3} \end{array} \quad \text{or} \quad \begin{array}{r} 3b + 11 < -1 \\ \underline{-11} \quad \underline{-11} \\ \frac{3b}{3} \quad \frac{-12}{3} \end{array}$$

$$-1 - 11 = \boxed{}$$

A) -12

B) 12

$$b > \frac{-10}{3} \quad \text{or} \quad b < \boxed{}$$

$$b > \boxed{} \quad \text{or} \quad b < \boxed{}$$

$$-12 \div 3 = \boxed{}$$

A) -4

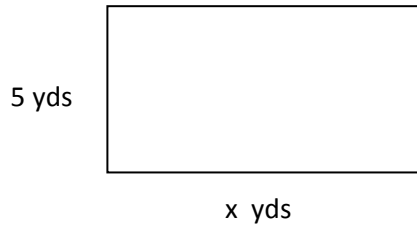
B) 3

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Assignment 1.6
Solving Compound and Absolute Value Inequalities

FENCING

Don is building a fence around a rectangular plot and wants the perimeter to be between 17 and 20 yards. The width of the plot is 5 yards. Write and solve a compound inequality to describe the range of possible measures for the length of the fence.



$$P = 5 + x + 5 + x$$

$$P = 5 + 5 + x + x$$

$$P = 10 + \boxed{}$$

$$1x + 1x = \boxed{}$$

A) 2x
B) 1x

$$7 \div 2 = \boxed{}$$

A) 12
B) 14

$$17 < 10 + 2x < 20$$

$$\frac{-10}{2} \quad \frac{-10}{2} \quad \frac{-10}{2}$$

$$\frac{7}{2} < \frac{2x}{2} < \frac{10}{2}$$

$$\frac{7}{2} < x < \boxed{}$$

$$\boxed{} < x < \boxed{}$$

$$10 \div 2 = \boxed{}$$

A) 5
B) 8

The length of the fence can be between $\boxed{}$ ft and $\boxed{}$ ft.

Assignment 1.6

Solving Compound and Absolute Value Inequalities

Solve each inequality. Graph the solution set on a number line.

$$11 - 3 = \boxed{}$$

$$8 \div 4 = \boxed{}$$

$$4x + 3 < 11$$

$$4x - 3 < 11 - 3$$

$$\frac{4x}{4} < \frac{\boxed{}}{4}$$

or

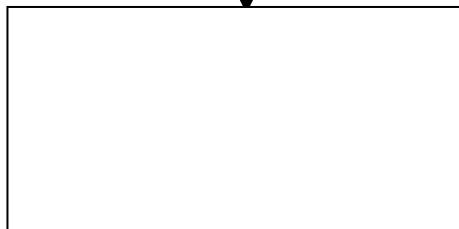
$$2x - 1 > 9$$

$$2x + 1 > 9 + 1$$

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

$$9 + 1 = \boxed{}$$

$$10 \div 2 = \boxed{}$$



$$-1 < 3a + 2 < 14$$

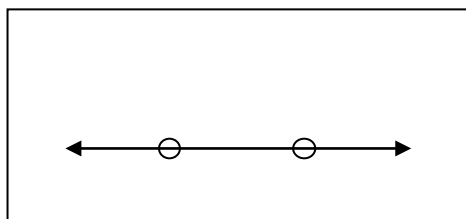
$$\frac{-2}{3} < \frac{3a}{3} < \frac{12}{3}$$

$$-1 - 2 = \boxed{}$$

$$14 - 2 = \boxed{}$$

$$\boxed{} \div 3 = \boxed{}$$

$$\boxed{} \div 3 = \boxed{}$$



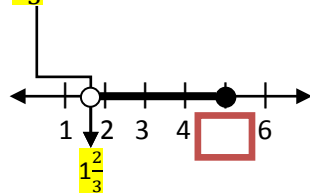
$$-1 < 3(d - 2) \leq 9$$

$$-1 < 3d - 6 \leq 9$$

$$\frac{-5}{3} < \frac{3d}{3} \leq \frac{15}{3}$$

$$\boxed{} < d \leq 5$$

$$1\frac{2}{3} < d \leq \boxed{}$$



$$-1 + 6 = \boxed{}$$

$$9 + 6 = \boxed{}$$

$$\boxed{} \div 3 = \boxed{}$$

$$\boxed{} \div 3 = \boxed{}$$

Assignment 1.6

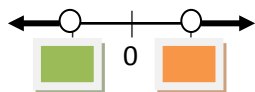
Solving Compound and Absolute Value Inequalities

$$\begin{array}{l}
 5y - 4 > 16 \quad \text{or} \quad 3y + 2 < 1 \\
 \underline{+4} \quad \underline{+4} \quad \downarrow \quad \underline{-2} \quad \underline{-2} \\
 \frac{5y}{5} > \frac{\boxed{20}}{5} \quad \text{or} \quad \frac{3y}{3} < \frac{\boxed{-1}}{3} \\
 y > \boxed{4} \quad \text{or} \quad y < \boxed{-\frac{1}{3}}
 \end{array}$$

$$\begin{array}{l}
 16 + 4 = \boxed{20} \\
 1 - 2 = \boxed{-1} \\
 \boxed{20} \div 5 = \boxed{4}
 \end{array}$$

$$\begin{array}{l}
 |x| + 1 > 12 \\
 \underline{-1} \quad \underline{-1} \\
 |x| > \boxed{11} \\
 x > \boxed{11} \quad \text{or} \quad \frac{-x}{-1} > \frac{11}{-1} \\
 x > \boxed{11} \quad \text{or} \quad x < \boxed{-11}
 \end{array}$$

$$\begin{array}{l}
 12 - 1 = \boxed{11} \\
 \boxed{11} \div -1 = \boxed{-11}
 \end{array}$$

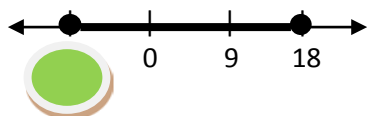


$$|2y - 9| \leq 27$$

$$2y - 9 \leq 27 \quad \text{and} \quad \frac{-(2y - 9)}{-1} \leq \frac{27}{-1}$$

$$\begin{array}{l}
 2y - 9 \leq 27 \quad \text{and} \quad \frac{-(2y - 9)}{-1} \leq \frac{27}{-1} \\
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 \frac{2y}{2} \leq \frac{36}{2} \quad \text{and} \quad \frac{2y}{2} \geq \frac{-27}{2}
 \end{array}$$

$$y \leq 18 \quad \text{and} \quad y \geq \boxed{-13.5}$$



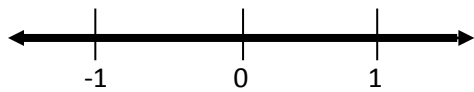
$$\begin{array}{l}
 -1 \bullet 2y = \boxed{-2y} \quad -1 \bullet -9 = \boxed{9} \\
 \boxed{-2y} \quad \boxed{9} \div -1 = \boxed{-2y + 9} \\
 27 \div -1 = \boxed{-27} \\
 \boxed{-2y + 9} + 9 = \boxed{-2y + 18} \\
 \boxed{-2y + 18} \div 2 = \boxed{-y + 9}
 \end{array}$$

Assignment 1.6
Solving Compound and Absolute Value Inequalities

$$|5n - 8| > -4$$

Since Absolute Values are always positive, then $|5n - 8|$ is always greater than -4 .

So $n = \mathbb{R}$ (n can be all Real Numbers)



$$|3b + 11| > 1$$

$$3b + 11 > 1 \quad \text{or} \quad \frac{-(3b + 11)}{-1} > \frac{1}{-1}$$

$$\begin{array}{lcl} 3b + 11 > 1 & \text{or} & 3b + 11 < -1 \\ \underline{-11} & & \underline{-11} \\ \frac{3b}{3} & & \frac{3b}{3} < \frac{-12}{3} \end{array}$$

$$-10 \div 3 = \boxed{}$$

$$b > \frac{-10}{3} \quad \text{or} \quad b < \boxed{}$$

$$b > \boxed{} \quad \text{or} \quad b < \boxed{}$$

$$-1 - 11 = \boxed{}$$

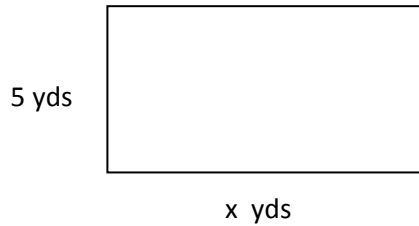
$$-12 \div 3 = \boxed{}$$

○○

Assignment 1.6
Solving Compound and Absolute Value Inequalities

FENCING

Don is building a fence around a rectangular plot and wants the perimeter to be between 17 and 20 yards. The width of the plot is 5 yards. Write and solve a compound inequality to describe the range of possible measures for the length of the fence.



$$P = 5 + x + 5 + x$$

$$P = 5 + 5 + x + x$$

$$P = 10 + \boxed{}$$

$$5 + 5 = 10$$

$$1x + 1x = \boxed{}$$

$$17 < 10 + 2x < 20$$

$$\frac{-10}{2} \quad \frac{-10}{2} \quad \frac{-10}{2}$$

$$\frac{7}{2} < \frac{2x}{2} < \frac{10}{2}$$

$$7 \div 2 = \boxed{}$$

$$\frac{7}{2} < x < \boxed{}$$

$$\boxed{} < x < \boxed{}$$

$$10 \div 2 = \boxed{}$$

The length of the fence can be between $\boxed{}$ ft and $\boxed{}$ ft.

Assignment 1.6

Solving Compound and Absolute Value Inequalities

Solve each inequality. Graph the solution set on a number line.

$$11 - 3 = \boxed{}$$

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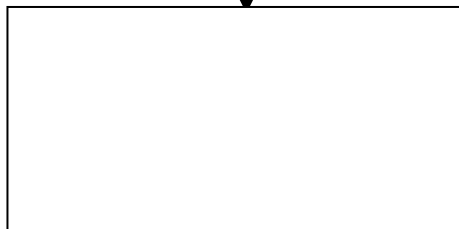
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$$2x + 1 > 9 + 1$$

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

$$9 + 1 = \boxed{}$$

$$10 \div 2 = \boxed{}$$



$$-1 < 3a + 2 < 14$$

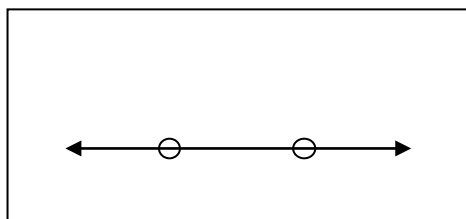
$$\frac{-2}{3} < \frac{3a}{3} < \frac{12}{3}$$

$$-1 - 2 = \boxed{}$$

$$14 - 2 = \boxed{}$$

$$\boxed{} \div 3 = \boxed{}$$

$$\boxed{} \div 3 = \boxed{}$$



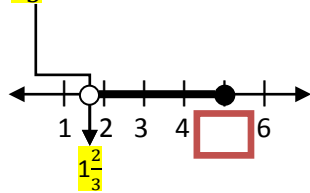
$$-1 < 3(d - 2) \leq 9$$

$$-1 < 3d - 6 \leq 9$$

$$\frac{-5}{3} < \frac{3d}{3} \leq \frac{15}{3}$$

$$\boxed{} < d \leq 5$$

$$1\frac{2}{3} < d \leq \boxed{}$$



$$-1 + 6 = \boxed{}$$

$$9 + 6 = \boxed{}$$

$$\boxed{} \div 3 = \boxed{}$$

$$\boxed{} \div 3 = \boxed{}$$

Assignment 1.6

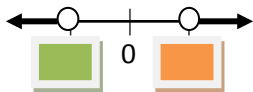
Solving Compound and Absolute Value Inequalities

$$\begin{array}{l}
 5y - 4 > 16 \quad \text{or} \quad 3y + 2 < 1 \\
 \begin{array}{r} +4 \\ \hline 5y \end{array} > \begin{array}{r} +4 \\ \hline \end{array} \quad \text{or} \quad \begin{array}{r} -2 \\ \hline 3y \end{array} < \begin{array}{r} -2 \\ \hline \end{array} \\
 y > \begin{array}{r} \\ \hline \end{array} \quad \text{or} \quad y < \begin{array}{r} \\ \hline \end{array}
 \end{array}$$

$$\begin{array}{l}
 16 + 4 = \begin{array}{r} \\ \hline \end{array} \\
 1 - 2 = \begin{array}{r} \\ \hline \end{array} \\
 \begin{array}{r} \\ \hline \end{array} \div 5 = \begin{array}{r} \\ \hline \end{array}
 \end{array}$$

$$\begin{array}{l}
 |x| + 1 > 12 \\
 \begin{array}{r} -1 \\ \hline |x| \end{array} > \begin{array}{r} -1 \\ \hline \end{array} \\
 x > \begin{array}{r} \\ \hline \end{array} \quad \text{or} \quad \frac{-x}{-1} > \frac{11}{-1} \\
 x > \begin{array}{r} \\ \hline \end{array} \quad \text{or} \quad x < \begin{array}{r} \\ \hline \end{array}
 \end{array}$$

$$\begin{array}{l}
 12 - 1 = \begin{array}{r} \\ \hline \end{array} \\
 \begin{array}{r} \\ \hline \end{array} \div -1 = \begin{array}{r} \\ \hline \end{array}
 \end{array}$$



$$\begin{array}{l}
 |2y - 9| \leq 27 \\
 2y - 9 \leq 27 \quad \text{and} \quad \frac{-(2y - 9)}{-1} \leq \frac{27}{-1} \\
 \begin{array}{r} +9 \\ \hline 2y \end{array} \leq \begin{array}{r} +9 \\ \hline 36 \end{array} \quad \text{and} \quad \begin{array}{r} +9 \\ \hline 2y \end{array} \geq \begin{array}{r} +9 \\ \hline 9 \end{array} \\
 y \leq 18 \quad \text{and} \quad y \geq \begin{array}{r} \\ \hline \end{array}
 \end{array}$$

$$\begin{array}{l}
 -1 \bullet 2y = \begin{array}{r} \\ \hline \end{array} \quad -1 \bullet -9 = \begin{array}{r} \\ \hline \end{array} \\
 \begin{array}{r} \\ \hline \end{array} \div -1 = \begin{array}{r} \\ \hline \end{array} \\
 27 \div -1 = \begin{array}{r} \\ \hline \end{array} \\
 \begin{array}{r} \\ \hline \end{array} + 9 = \begin{array}{r} \\ \hline \end{array} \\
 \begin{array}{r} \\ \hline \end{array} \div 2 = \begin{array}{r} \\ \hline \end{array}
 \end{array}$$

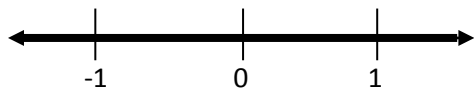
Closed Strategy

Assignment 1.6
Solving Compound and Absolute Value Inequalities

$$|5n - 8| > -4$$

Since Absolute Values are always positive, then $|5n - 8|$ is always greater than -4 .

So $n \in \mathbb{R}$ (n can be all Real Numbers)



$$|3b + 11| > 1$$

$$1 - 11 = \boxed{}$$

$$-10 \div 3 = \boxed{}$$

$$3b + 11 > 1 \quad \text{or} \quad \frac{-(3b + 11)}{-1} > \frac{1}{-1}$$

$$\begin{array}{rcl} 3b + 11 > 1 & \text{or} & \boxed{} + \boxed{} < -1 \\ \underline{-11} & & \underline{-11} \\ \frac{3b}{3} & & \frac{\boxed{}}{3} < \frac{\boxed{}}{3} \end{array}$$

$$b > \frac{-10}{3} \quad \text{or} \quad b < \boxed{}$$

$$b > \boxed{} \quad \text{or} \quad b < \boxed{}$$

$$-3b \div -1 = \boxed{}$$

$$-11 \div -1 = \boxed{}$$

$$-1 - 11 = \boxed{}$$

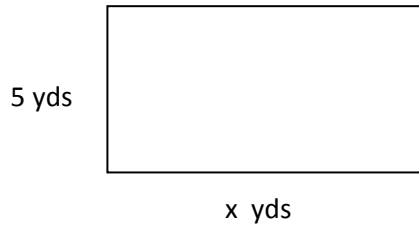
$$-12 \div 3 = \boxed{}$$

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Assignment 1.6
Solving Compound and Absolute Value Inequalities

FENCING

Don is building a fence around a rectangular plot and wants the perimeter to be between 17 and 20 yards. The width of the plot is 5 yards. Write and solve a compound inequality to describe the range of possible measures for the length of the fence.



$$P = 5 + x + 5 + x$$

$$P = 5 + 5 + x + x$$

$$P = \boxed{} + \boxed{}$$

$$5 + 5 = \boxed{}$$

$$1x + 1x = \boxed{}$$

$$17 - 10 = \boxed{}$$

$$7 \div 2 = \boxed{}$$

$$17 < 10 + 2x < 20$$

$$\frac{\boxed{}}{2} < \frac{2x}{2} < \frac{\boxed{}}{2}$$

$$20 - 10 = \boxed{}$$

$$10 \div 2 = \boxed{}$$

$$\frac{7}{2} < x < \boxed{}$$

$$\boxed{} < x < \boxed{}$$

The length of the fence can be between $\boxed{}$ ft and $\boxed{}$ ft.

Assignment 1.6
Solving Compound and Absolute Value Inequalities

Solve each inequality. Graph the solution set on a number line.

$$4x + 3 < 11 \text{ or } 2x - 1 > 9$$

$$-1 < 3a + 2 < 14$$

$$-1 < 3(d-2) \leq 9$$

$$5y - 4 > 16 \text{ or } 3y + 2 < 1$$

$$|x| + 1 > 12$$

$$|2y - 9| \leq 27$$

$$|5n - 8| > -4$$

$$|3b + 11| > 1$$

Open-ended

Assignment 1.6
Solving Compound and Absolute Value Inequalities

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