

b.1 Solving

Dec. 11, 2006

Inequalities w/ Add. & Subt.

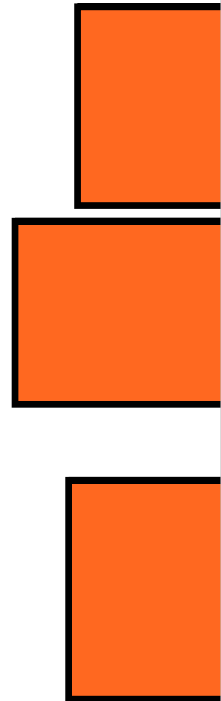
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Recall:

1 Variable: 1 Dimension

2 Variables: 2 Dimensions

3 Variables: 3 Dimension



graph of an Inequality: the set  
of points on a number line  
(x-axis)  
that represents all solutions  
of the One Variable inequality

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Real Numbers: All #'s, Pos. & Neg.  
Including Frac. Dec. & 0

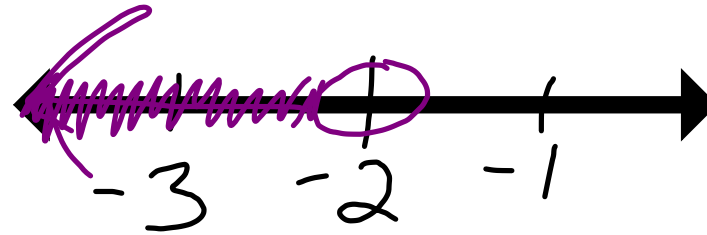
$(-\infty, \infty)$  Symbol  $\rightarrow \mathbb{R}$

Bold  $\mathbb{R}$

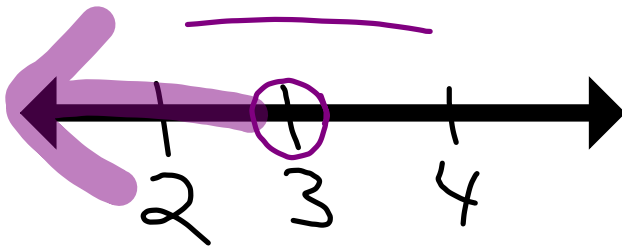
Recall:

$$\begin{array}{r} x + 6 = 4 \\ -6 \quad -6 \\ \hline x = -2 \\ \hline \hline \end{array}$$

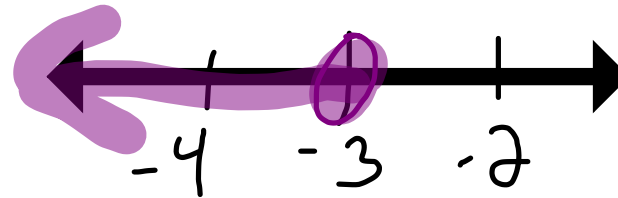
$$\begin{array}{r} x + 6 < 4 \\ -6 \quad -6 \\ \hline x < -2 \\ \hline \end{array}$$



$$\begin{array}{r} -2 > n - 5 \\ +5 \quad +5 \\ \hline 3 > n \\ \hline \end{array}$$



$$\begin{array}{r} p - 1 \leq -4 \\ +1 \quad +1 \\ \hline p \leq -3 \\ \hline \end{array}$$



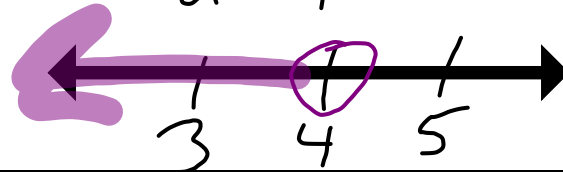
## b.2 Solving Inequalities w/ Multiplication + Division

Review:

$$\frac{5a}{5} = \frac{20}{5}$$
$$\underline{\underline{a = 4}}$$

$$\frac{5a}{5} < \frac{20}{5}$$

$$a < 4$$

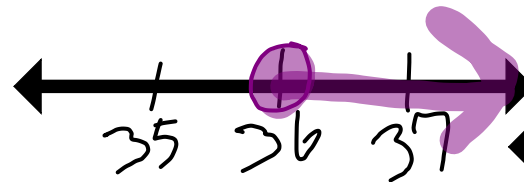


$$4 \cdot \frac{b}{4} = 9 \cdot 4$$

$$\underline{\underline{b = 36}}$$

$$4 \cdot \frac{b}{4} \geq 9 \cdot 4$$

$$b \geq 36$$



Check 40:

$$\frac{40}{4} \stackrel{?}{\geq} 9$$

$$10 \geq 9 \quad \checkmark$$

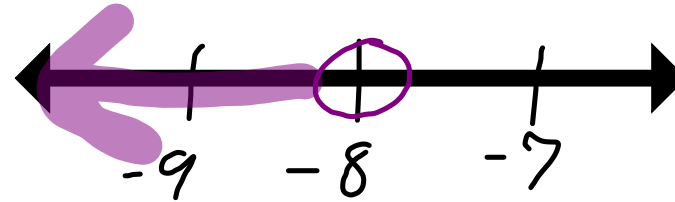
Review:

$$\frac{-4c}{-4} = \frac{32}{-4}$$

$$\underline{\underline{c = -8}}$$

$$\frac{-4c}{-4} > \frac{32}{-4}$$

$$\underline{c < -8}$$



Check

$$0 \quad ?$$
$$-4(0) > 32$$

$0 > 32$  False....

Check -10

$$-4(-10) > 32$$

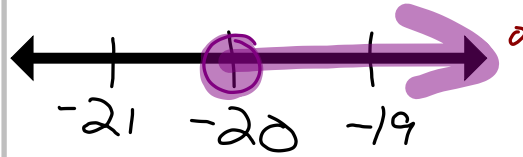
$40 > 32$ ... True

## Conclusion:

If we need to Multiply  
Or Divide by a Neg. #  
to Solve the Inequality  
Then we **MUST** Switch  
the Inequality Sign!

$$\cancel{2} \left( \cancel{\frac{1}{2}} x \right) \leq 10 \cdot \cancel{-2}$$
$$x \geq -20$$

This should  
Be Done First  
Because we ~~are~~  
By  $-2$ .



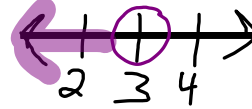
Check 0

$$\frac{-1}{2}(0) \stackrel{?}{\geq} 10$$
$$0 \leq 10 \quad \checkmark$$

Conclusions

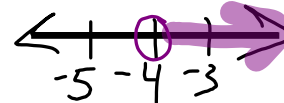
$x < 3$  All  $\mathbb{R}$  less 3

$3 > x$

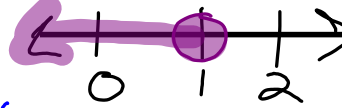


$a > -4$  All  $\mathbb{R}$  greater than -4

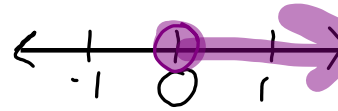
$-4 < a$



$b \leq 1$  All  $\mathbb{R}$  less than or equal to 1



$c \geq 0$  All  $\mathbb{R}$  greater than or equal to 0



O.T.L.

① pg 326-327:

3, 6, 10, 12, 16, 24-28 (e)

41, 44, 50, 54

② pg 332: Summary Box  
at the Bottom of the Page.  
in Notes

③ pg 333: 15-31 (o)  
Show Work.