

Homework Qs

Note Title

9/14/2015

2.5 #5) Five times the sum of a number and seven is 30. Find the number.

a number: x

$$5(x+7)=30$$

$$5x + 35 = 30$$

$$5x = -5$$

$$x = -1$$

The number is -1 .

2.5 #19) Pat is 20 years older than Patrick. In 2 years Pat will be twice as old as Patrick. How old are they now?

	Age now	Age in 2 yrs
Pat	$x+20$	$x+20+2 = x+22$
Patrick	x	$x+2$

Pat's age now

compare to

Patrick's age now
 x

$$2 \left(\begin{array}{l} \text{Patrick's} \\ \text{age in} \\ \text{2 yrs} \end{array} \right) = \left(\begin{array}{l} \text{Pat's age} \\ \text{in 2 yrs} \end{array} \right)$$

$$2(x+2) = x+22$$

2.7: Linear Inequalities

2

Notation:

$<$ means "is less than"

$>$ means "is greater than"

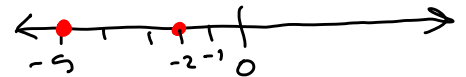
$\leq$ or $\leq$ means "is less than or equal to"

$\geq$ or $\geq$ means "is greater than or equal to"

True or false?

$$2 < 5 \quad \text{True}$$

$$-2 < -5 \quad \text{False}$$

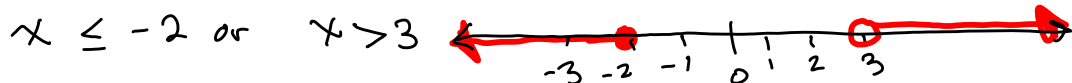
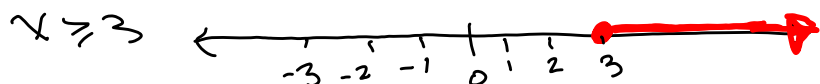
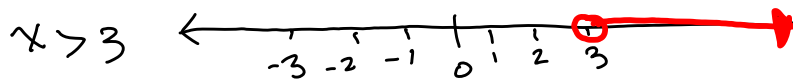
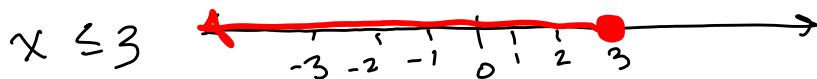
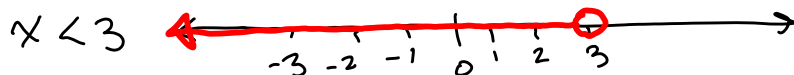


$$3 \geq 2 \quad \text{True}$$

$$2 \geq 2 \quad \text{True}$$

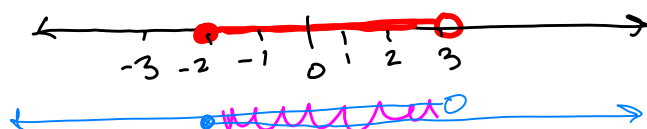
$$2 > 2 \quad \text{False}$$

we can use number lines to represent inequalities that have variables in them.



$$-2 \leq x < 3$$

This means that
 $-2 \leq x$ and $x < 3$
 $x \geq -2$



Additive Property of Inequality

3

If $a < b$, then $a + c < b + c$

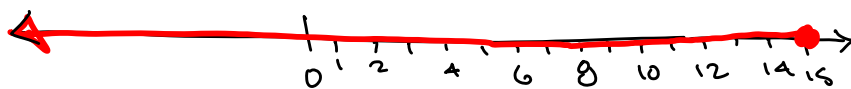
This means we can add (or subtract) the same expression on both sides.

Example: Solve. $x - 2 \leq 13$

$$\overset{+2}{x} \leq \overset{+2}{13}$$

$x \leq 15$

Graph on number line.



OR



Multiplicative Property of Inequality

If $a < b$ and $c > 0$, then $ac < bc$.

If $a < b$ and $c < 0$, then $ac > bc$.

This means:

We can multiply (or divide) both sides by the same positive number.

We can multiply (or divide) both sides by the same negative number if we reverse the inequality sign.

why?

see next page

Why?

(4)

$$1 < 2 \quad \text{True}$$

multiply both sides by 3:

$$1(3) < 2(3)$$

$$3 < 6 \quad \text{True!}$$

Begin again with $1 < 2$. Still true

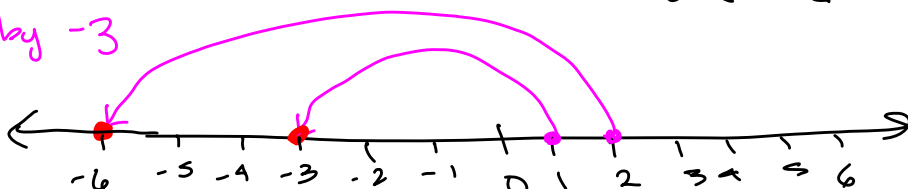
Multiply both sides by -3 :

$$1(-3) < 2(-3)$$

$$-3 < -6$$

False!

multiply by -3



Multiplying by a negative reverses the order.

$$\text{start with } -2 < 3 \quad \text{True}$$

multiply by -1 :

$$-2(-1) < 3(-1)$$

$$2 < -3 \quad \text{False!}$$

multiply by -1



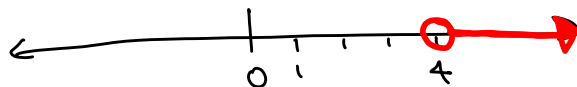
Example:

solve.

$$9x > 36$$

$$\frac{9x}{9} > \frac{36}{9}$$

$$x > 4$$



Ex:

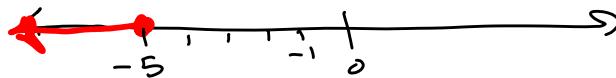
Solve.

5

$$-4x \geq 20$$

$$\frac{-4x}{-4} \leq \frac{20}{-4} \leftarrow \text{Reverse the inequality sign!}$$

$$x \leq -5$$

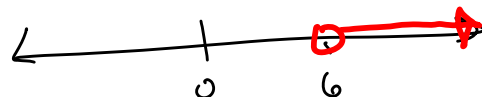


Ex:

$$-3x < -18$$

$$\frac{-3x}{-3} > \frac{-18}{-3} \leftarrow \text{Reverse the inequality}$$

$$x > 6$$



$$2x \geq -18$$

$$\frac{2x}{2} \geq \frac{-18}{2}$$

$$x \geq -9$$

Ex: solve.

$$3x + 5 > 9x - 19$$

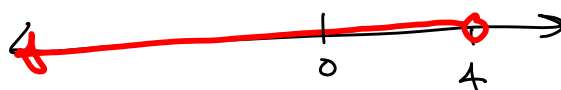
$$-6x + 5 > -19$$

$$-6x > -24$$

$$\frac{-6x}{-6} < \frac{-24}{-6}$$

$$x < 4$$

Reverse the ~~inequ~~ inequality



See next page

for alternative
solution

02

⑥

$$3x + 5 > 9x - 19$$

$-3x$ $-3x$

$$5 > 6x - 19$$

$+19$ $+19$

$$24 > 6x$$

$$\frac{24}{6} > \frac{6x}{6}$$

$$4 > x$$

$$x < 4$$

