Algebra 1 Day 9 Notes -- Solving Linear Inequalities

WARM UP:

1.) Find the product: $(2x+3)(3x^2+4x+2)$

mult.

	$3x^2$	$+4x$	$+2$
$2x$	$6x^3$	$+8x^2$	$+4x$
$+3$	$+9x^2$	$+12x$	$+6$

$6x^3+17x^2+16x+6$

2.) Evaluate the following expression $\dfrac{a^2+|a|}{-b}$ if $a=-3$ and $b=-2$.

$$\frac{(-3)^2+|(-3)|}{-(-2)} = 6$$

3.) Find the difference when $4x^2-3x+2$ is subtracted from $4x^2+3x-5$.

(2) (1)

$$(4x^2+3x-5)-(4x^2-3x+2)$$

$$4x^2+3x-5-4x^2+3x-2$$

$$6x-7$$

4.) Solve for x: $\frac{9}{4}\left(x-\frac{7}{5}\right)=18$

$\frac{9}{4}x - \frac{63}{20} = 18$

$\frac{9}{4}x \cdot \boxed{20} - \frac{63}{20} \cdot \boxed{20} = 18 \cdot \boxed{20}$

$45x - 63 = 360$

$+63 \quad +63$

$\frac{45x}{45} = \frac{423}{45}$

$\boxed{x = 9.4}$

5.) If $ax+by=c$, what is x expressed in terms of a, b, c, and y?

$ax + by = c$

$-by \quad -by$

$\frac{ax}{a} = \frac{c-by}{a}$

$\boxed{x = \frac{c-by}{a}}$

Solving Linear Inequalities…

INEQUALITY SYMBOLS→

$>$ Greater than

$<$ less than

$\leq$ less than or equal to

$\geq$ greater than or equal to

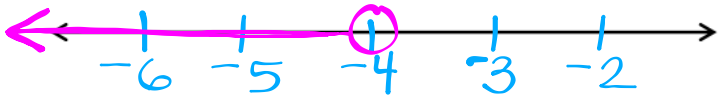
WHEN YOU GRAPH ON A NUMBER LINE →

- The direction of the arrow indicates where the solutions are!

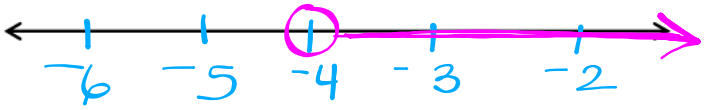
$\leq, \geq$ ● Indicates the value **IS** part of the solution

$<, >$ ○ Indicates the value **IS NOT** part of the solution set

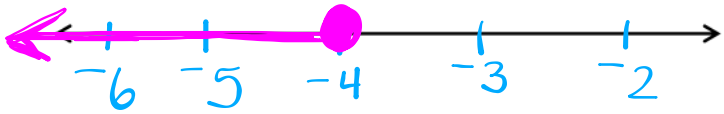
$x < -4$



$x > -4$

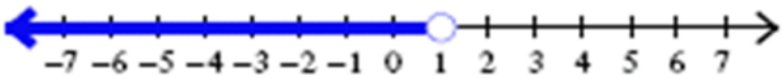


$x \leq -4$

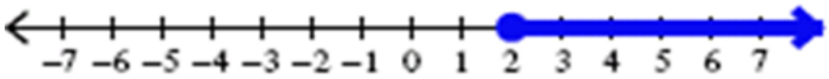


$x \geq -4$

Describe the solution set for each of the following graphs:

1. 

This inequality indicates that the solution set is Less than 1.

2. 

This inequality indicates that the solution set is greater than or equal to 2.

- **Solve just like you do for an equation (except no = sign).**
- **The only difference, is when you multiply or divide by a NEGATIVE, the inequality sign FLIPS!**

Solve each of the following inequalities and graph the solution set on a number line.

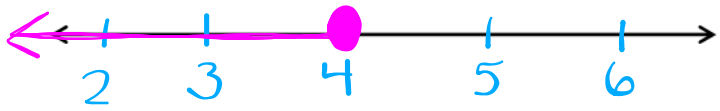
Examples:

1. $3y + 1 \leq 13$

$-1 \quad -1$

$\frac{3y}{3} \leq \frac{12}{3}$

$y \leq 4$

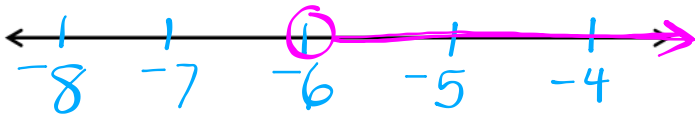


2. $-2x - 5 < 7$

$+5 \quad +5$

$\frac{-2x}{-2} < \frac{12}{-2}$

$x > -6$



3. $-3x + 6(x - 2) \geq 9$

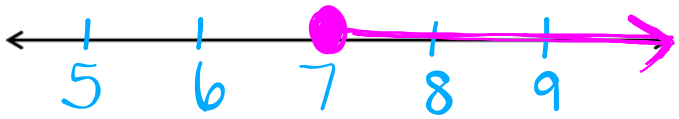
$-3x + 6x - 12 \geq 9$

$3x - 12 \geq 9$

$+12 \quad +12$

$\frac{3x}{3} \geq \frac{21}{3}$

$x \geq 7$



4. $-3(2x - 8) > 2(x - 8)$

$-6x + 24 > 2x - 16$

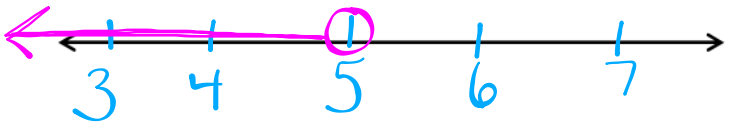
$-2x \quad -2x$

$-8x + 24 > -16$

$-24 \quad -24$

$\frac{-8x}{-8} > \frac{-40}{-8}$

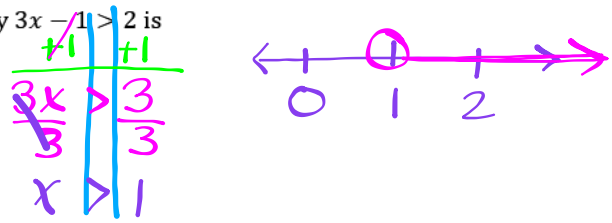
$x < 5$



5. The smallest whole number that satisfies the inequality $3x - 1 > 2$ is

(1) 1 (2) 2

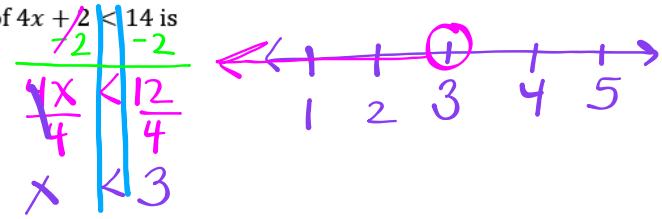
(3) 3 (4) 0



6. If x is a positive integer, then the solution set of $4x + 2 < 14$ is

(1) {1} (2) {1,2}

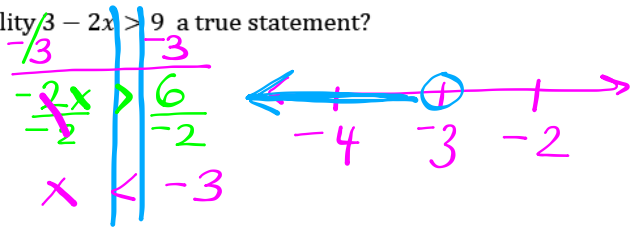
(3) {1,2,3} (4) {1,2,3,4}



7. Which is the greatest integer that makes the inequality $3 - 2x > 9$ a true statement?

(1) -2 (2) 2

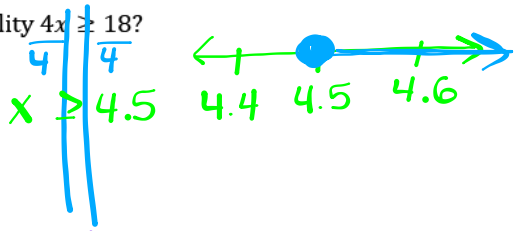
(3) 5 (4) -4



8. Which number is *not* a member of the solution set of the inequality $4x \geq 18$?

(1) 4.4 (2) 4.5

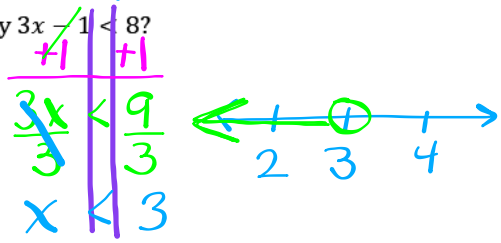
(3) 4.6 (4) 4.7



9. What is the *greatest* whole number that satisfies the inequality $3x - 1 < 8$?

(1) 1 (2) 2

(3) 3 (4) 0



NOT

10. Which value of x is in the solution set of $\frac{4}{3}x + 5 < 17$?

(1) -8 (3) -4

(2) -6 (4) 12