Alg. 1-BE Monday 11-2-09

Y varies directly as X, write the direct variation equation then solve for the specified variable:

① Y is 5 when X is -2, find X when Y is 4.

② Y is 12 when X is 1, find Y when X is $-\frac{1}{2}$.

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③ What type of equation is $\frac{x}{5} = \frac{3}{9}$

④ Use the basic property of this type of equation to solve it.

(*d) NAME EACH SYMBOL:

$<$ less than, (Ex) $3 < 9$

$>$ greater than (Ex) $9 > 3$

$\leq$ less than or EQUAL

(Ex) $4 \leq 4$

$2 \leq 4$

$\geq$ greater than or EQUAL

(Ex) $4 \geq 4$

$4 \geq 2$

"NOT" EQUALS SIGNS

INEQUALITY symbols

(d)

INEQUALITY — A MATH EXPRESSION WITH A $<, \leq, >, \geq$ SYMBOL

How do you "solve" an inequality?

Lets see what works...

(Ex) $3 < 9$ Lets add 4

$+4 \quad +4$

$7 < 13$ OK ✓

$3 < 9$ Lets subtract 4

$-4 \quad -4$

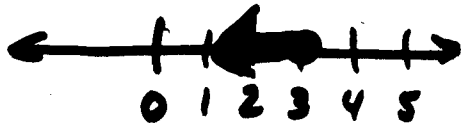
$-1 < 5$ OK ✓

We can use add/subtract "undos" to solve inequalities just like equations.

(Ex) $x + 6 \leq 9$

$-6 \quad -6$

$\boxed{x \leq 3}$ SOLUTION



Lets try multiply/divides:

$3 < 9$ Try multiplying by 4

$4 \cdot 3 < 9 \cdot 4$

$12 < 36$ ✓

$\frac{3}{3} < \frac{9}{3}$ Try dividing by 3

$1 < 3$ ✓

OK for multiplying/dividing by <u>Positive</u> numbers, what about multiplying or dividing by a <u>negative</u> number??

<u>Alert</u>: which is true?

$-16 < -15$ $\quad 16 < 15$

or $-16 > -15$ $\quad$ or $16 > 15$

$-16 < -15$ BUT $16 > 15$

Try $3 < 9$ Times -4

$-4 \cdot 3 < 9 \cdot -4$

$-12 < -36$ False, flip the inequality to make it true

$-12 > -36$

$\frac{3}{-3} < \frac{9}{-3}$ divided by -3

$-1 < -3$ False, flip $<$

$\boxed{-1 > -3}$

Since negatives and positives behave differently with $<, >, \leq, \geq$ symbols, and since multiplying or dividing by a negative changes the sign of whatever you are doing it to, you must "flip" the inequality.

GRI Golden Rule of Inequalities

Same as GRE except, if you multiply or divide by a negative, flip the inequality.

(EX) $x - 45 \leq 13$

$+45 \quad +45$

$\boxed{x \leq 58}$

Never flip when adding or subtracting

(EX) $2x + 6 < -3$

$-6 \quad -6$ NFWAOS

$\frac{2x}{2} < \frac{-9}{2}$

Never flip when mult. or dividing by a positive

$\boxed{x < -\frac{9}{2}}$

(Ex) $5 - 3x \geq 14$

$-5 \qquad\qquad -5$

$\frac{-3x}{-3} \geq \frac{9}{-3}$

$\boxed{x \leq -3}$

← SINCE YOU CHANGED ALL SIGNS WHEN YOU ÷ by −3, YOU MUST flip ≥

(Ex) $\frac{x}{-2} < 5$

$-2 \cdot \frac{x}{-2} > 5 \cdot -2$ MULT. BY −2, MUST flip

$\boxed{x > -10}$

SOME INEQUALITIES ⇒ NO flip

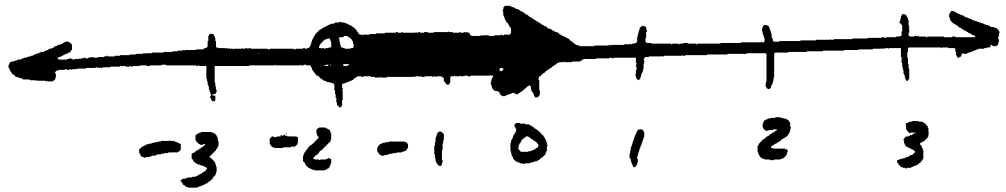
SOME INEQUALITIES ⇒ ONE flip

SOME INEQUALITIES ⇒ MORE THAN ONE flip.

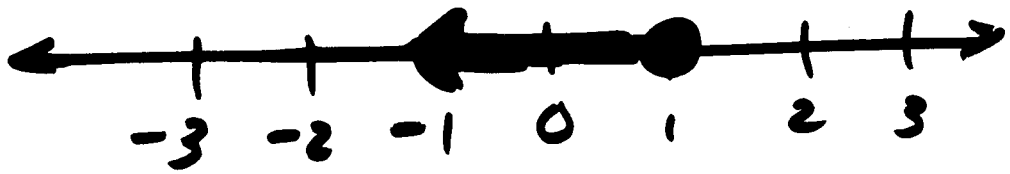
When graphing the SOLUTION to INEQUALITIES ON A NUMBER LINE:

$<$ or $>$	○	open dot
$\leq$ or $\geq$	●	closed dot

Ex $\boxed{x > -2}$



Ex $\boxed{x \leq 1}$



Ch. 6-1, 6-2, 6-3 DONE (except for checks)

Homework: Pg 335 # 4-8, 15-17.