November 18th

Due Next Class: Video Notes + HW 4.1

Unit 4: Inequalities
Lesson 4.1: Solving & Modeling Inequalities

Get Ready: Solve these equations

1. $5x + 1 = 3$

$-1 \quad -1$

$\frac{5x}{5} = \frac{2}{5}$

$x = \frac{2}{5}$

2. $3w - 1 = -2 + 2w$

$+2w \quad +2w$

$5w - 1 = -2$

$+1 \quad +1$

$\frac{5w}{5} = \frac{-1}{5}$

$w = -1/5$

3. $\frac{-5t}{4} = (2)4$

$-5t = 8$

$\frac{-5t}{-5} = \frac{8}{-5}$

$t = 8/-5$

Inequalities vs Equations:

Statement w/ an equals sign.

$>$	$<$	$\geq$	$\leq$
Greater than	Less than	Greater than or equal to	Less than or equal to

$g < 8$

"g is less than 8"

$w \geq 8$

"w is greater than or equal to 8"

Will inequalities give us an exact answer?

No, inequalities provide a RANGE of possible solutions.

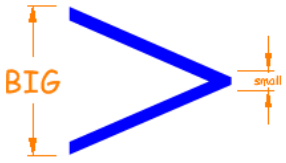
What is the difference?

$x > 8$

x is greater than 8

$8 > x$

8 is greater than x



$6 > t$

6 is greater than t.

$t < 6$

t is less than 6.

Sam cuts a 10 m rope into two.

How long is the longer piece?

How long is the shorter piece?

Long Piece

~~x~~ $L > 5$

$L < 10$

Short Piece

$S < 5$

$S > 0$

Solving Inequalities:

1. $5x + 1 < 3$

$-1 \quad -1$

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

$x < 2/5$

2. $3w - 1 \geq -2 - 2w$

$+2w \quad +2w$

$5w - 1 \geq -2$

$+1 \quad +1$

$\frac{5w}{5} \geq \frac{-1}{5}$

$w \geq -1/5$

3. $\frac{-5t}{4} > 2$ 4

$-5t > 8$

$\frac{-5t}{-5} > \frac{8}{-5}$

$t < -8/5$

Rule when solving inequalities...

When you multiply or divide by a NEGATIVE number, you must flip the direction of the inequality.

Solving Inequalities:

1) $p + 6p \leq 21$

$\frac{7p}{7} \leq \frac{21}{7}$

$p \leq 3$

2) $6 - 3r + 5 \leq 8$

$11 \quad 11$

$-3r \leq -3$

$r \geq 1$

3) $-7 - 6n \leq 1 - 7n$

$+7 \quad +7$

$-6n \leq 8 - 7n$

$+7n \quad +7n$

$n \leq 8$

4) $n - 4 - 1 > 4n - 4n$

$n - 5 > 0$

$+5 \quad +5$

$n > 5$

$-4 - 1$

$-4 + -1$

Beth is a waitress. She need to make **at least** 250 dollars on Friday and Saturday night in order to pay her bills next week. She made $112 on Friday night. How much does she need to make Saturday?

Write an INEQUALITY that represents this situation.

x = $ made on Saturday

$112 + x \geq 250$

$250 \leq 112 + x$

Solve your Inequality.

$x \geq 138$ $138 \leq x$

Answer the question in a complete sentence.

Jimmy is saving up money for the new xbox. He needs $400 for the new system and a new game. He already has $130 saved up and is shoveling driveways for extra money. If he charges $15 a driveway how many does he need to shovel to have enough money?

Write an INEQUALITY that represents this situation.

x = # of driveways

$15x + 130 \geq 400$

$-130 \quad -130$

$15x \geq 270$

$\frac{15x}{15} \geq \frac{270}{15}$

$x \geq 18$

Solve your Inequality.

Answer the question in a complete sentence.

Mrs. Mills is baking some treats for the holidays for the party in her neighborhood. She has already spent $38 on cookies but would also like to make some pies. She **doesn't want to spend more than** $100 on all of the treats.

How many pies can she make if each pie costs her $8?

Write an INEQUALITY that represents this situation.

$38 + 8x \leq 100$

Solve your Inequality.

$-38 \quad -38$

$\frac{8x}{8} \leq \frac{62}{8}$

$x \leq 7.75$

Answer the question in a complete sentence.

$x \leq 7$