

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. $5x + 1 = 3$

$$\begin{array}{r} \underline{-1} \quad \underline{-1} \\ 5x = 2 \\ \underline{\quad} \quad \underline{\quad} \\ x = 2/5 \end{array}$$

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

$$\begin{array}{r} +2w \quad +2w \\ 5w - 1 = -2 \\ \underline{+1} \quad \underline{+1} \\ 5w = -1 \\ \underline{\quad} \quad \underline{\quad} \\ w = -1/5 \end{array}$$

$$\begin{array}{r} -20t = -5t \\ \underline{\quad} \quad \underline{\quad} \\ \cancel{5}(-5t) = (2)4 \\ \underline{\quad} \quad \underline{\quad} \\ -5t = 8 \\ \underline{-5} \quad \underline{-5} \\ t = 8/-5 \end{array}$$

Inequalities vs Equations:

b/c they have

=

$>$
Greater than

$<$
Less than

\geq
Greater than or equal to

\leq
Less than or equal to

$g < 8$
g is less than 8

$w \geq 8$
w is greater than or equal to 8

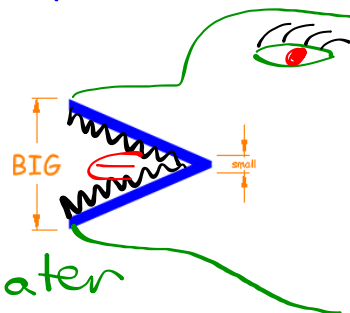
Will inequalities give us an exact answer?

No, instead the solution to an inequality is represented by a **RANGE** of numbers.

What is the difference?

$x > 8$
x is greater than 8.

$8 > x$
8 is greater than x.



$6 > t$

5 4

1 3

5.91

$t < 6$

4 5

-2 3.5

5.91

Sam cuts a 10 m rope into two.

How long is the longer piece?

How long is the shorter piece?



Longer Piece:

7, 5.1, 6, 9, 8, ~~10~~, ~~1~~

Don't know an exact value

Use an inequality to write the

RANGE of #'s

Shorter Piece:

4, 3, 1, 4.9, 0.001, 2, ~~10~~, ~~1~~

Solving Inequalities:

1. $5x + 1 < 3$

$$\begin{array}{r} -1 \quad -1 \\ \hline 5x < 2 \\ \hline x < \frac{2}{5} \end{array}$$

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

$$\begin{array}{r} +2w \quad +2w \\ \hline 5w - 1 \geq -2 \\ +1 \quad +1 \\ \hline 5w \geq -1 \\ \hline w \geq -\frac{1}{5} \end{array}$$

3. $\left(\frac{-5t}{4}\right) > (2) \cdot 4$

$$\begin{array}{r} -5t > 8 \\ \hline -5 \quad -5 \\ \hline t < -\frac{8}{5} \end{array}$$

Rule when solving inequalities...

When we multiply or divide by a negative #, Flip the direction of the inequality symbol.

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

$$x + 112 \geq 250$$

Solve your Inequality.

$$250 \leq x + 112$$

$$x \geq 138$$

$$138 \leq x$$

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.

$r = \#$ of
driveways shoveled

$$130 + 15r \geq 400$$

Solve your Inequality.

$$400 \leq 130 + 15r$$

$$r \geq 18$$

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.

$$\begin{array}{r} 38 + 8p \leq 100 \\ \underline{-38} \qquad \qquad \underline{-38} \end{array}$$

Solve your Inequality.

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

$$p \leq 7.75$$

Answer the question in a complete sentence.

$$p \leq 7$$