College Algebra
Class Notes


Solving Linear Inequalities, Interval Notation, and Domain (section 1.6)

## Solving Linear Inequalities

Solving linear inequalities is identical to solving linear equations, except when you do what?
Let's see if it comes up in these examples.
expl 1: Solve the inequality. Then check your solution by substituting a value from the solution set into the original inequality. Does it work? If not, why not?

expl 2: Solve the inequality. Then check your solution by substituting a value from the solution set into the original inequality. Does it work? If not, why not?

$$
\frac{x}{3} \geq 12
$$

expl 3: Solve the inequality. Write your answer in interval notation.
$9 x+13<3 x-5$

expl 4: Solve the inequality. Write your answer in interval notation.

$$
-20<10-3 x \leq 1
$$



## Review of Interval Notation:

Do you remember interval notation? Fill in the third column for these sets of numbers. The real number line graphs can help visualize the sets.


## Domain:

This is a topic we will look at a lot during the semester but we start with these examples. First, let's be sure we know what we are talking about.

Definition: Domain: the set of all $x$ values (that will give you a real number out for $y$ )

So, what does that mean? Consider the relationship $y=\frac{5}{x+3}$.


Many $x$ values will give you a real number out for $y$. But there is one value, that when substituted in for $x$, will give you garbage. What is it? Why does it result in garbage?

The domain of this relationship is everything else. Write it in words and then in interval notation. Can you write the domain in set builder notation too?
expl 5: What is the domain of the relationship $y=\sqrt{3+2 x}$ ? Write it in words and then in interval notation.

expl 6: What is the domain of the relationship $y=\frac{14}{\sqrt{6+x}}$ ? Write it in words and then in interval notation.


