Inequalities and Domain

Thursday, January 19, 2012
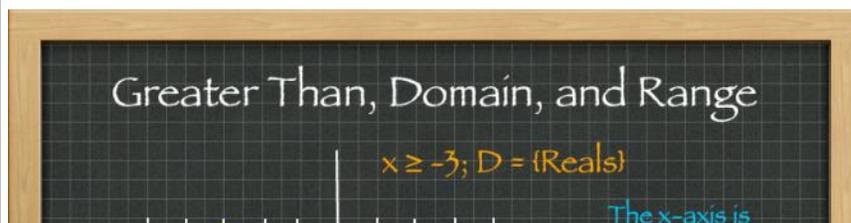5:26 PM
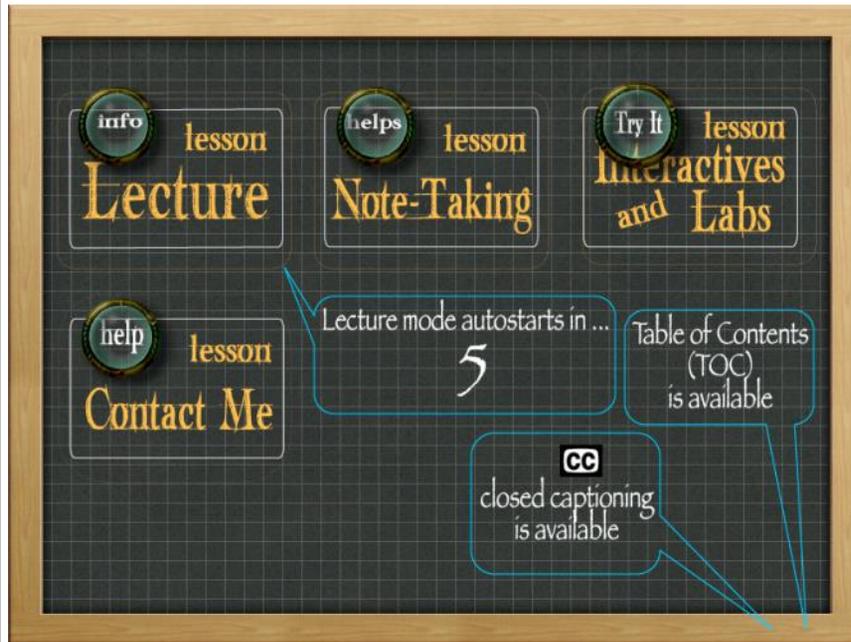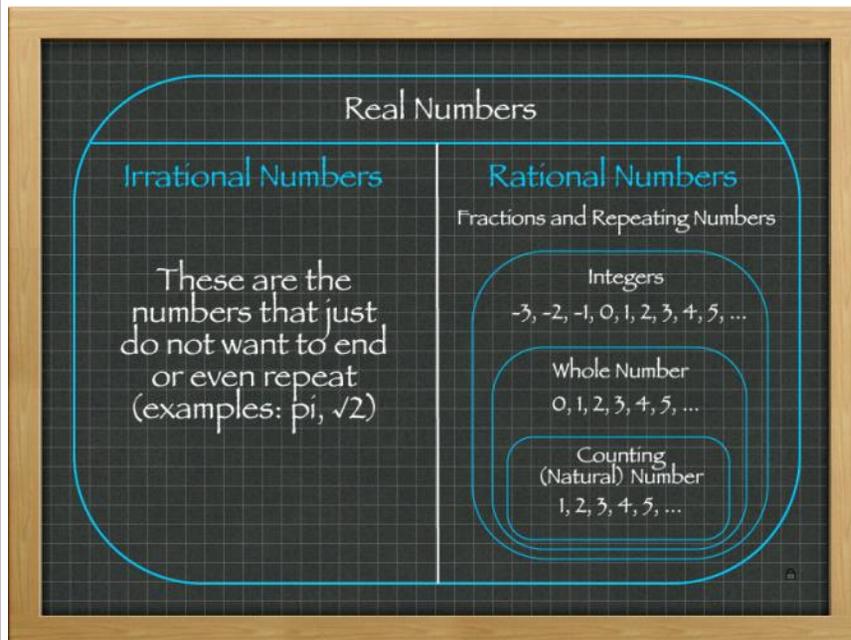
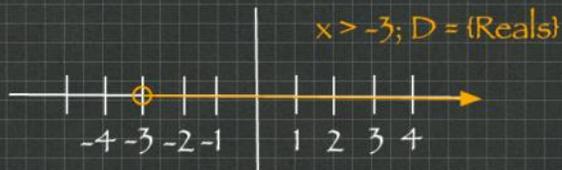| Slides	Notes
	To understand how to do these, it is essential that you have a handle on the rational number system and how they are subdivided. Spend some time here memorizing what a rational, Integer, whole, and counting or natural numbers are.
	You will be working with greater than and less than, which may seem like review from what you have learned in the past, but be sure to master the added part of domain. Domain has to do with the x-axis, which will be our focus here. Sometimes you will work with range as well. That one will deal with the y-axis.

Greater Than, Domain, and Range
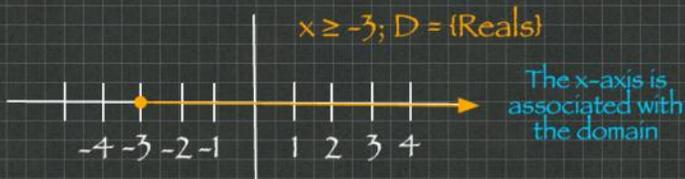
$x \geq -3; D = \{Reals\}$

The x-axis is associated with the domain

The y-axis is associated with the range

$x > -3; D = \{Reals\}$

which may seem like review from what you have learned in the past, but be sure to master the added part of domain.
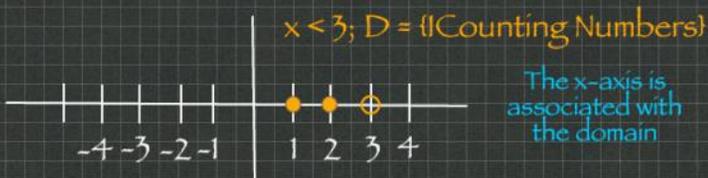
Domain has to do with the x-axis, which will be our focus here. Sometimes you will work with range as well. That one will deal with the y-axis.

If an inequality is greater than or equal to, you will use a filled in circle so that it shows that the number given in the statement is also included.

If the statement is only a greater than, you use a hollow circle to show that the number in the statement is not included.

When the line is continuous, as you see in these two examples, all the numbers and all the parts between them are indicated. This would mean that all the real numbers are included, so you write that D = {Reals}. Some texts will follow a slightly different format.

Greater Than, Domain, and Range

$x < 3; D = \{Counting Numbers\}$

The x-axis is associated with the domain

The y-axis is associated with the range

$x > -4; D = \{Negative Integers\}$
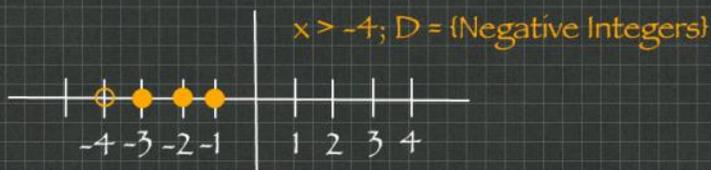
In these examples, the dots are communicating that the parts between the numbers are not to be included, The Domain for the top one is less than three, but as the domain shows, it is limited to only counting numbers so the negative numbers are not marked on the graph.

The bottom domain limits the possibilities to greater than 4 and negative integers.

So, the domain is an extra filter to what the answers can be.

Trichotomy Axiom

Exactly one of the following is tue:

$a < b$
$a = b$
$a > b$

Transitive Axiom

If a>b and b>c, then a>c
If a<b and b<c, then a<c

Trichotomy Axiom fits in this topic nicely. When you think about these statements plotted on a line graph, they are fully logical. Study them to be sure you see that logic.

If a>b and b>c, then a>c
If a<b and b<c, then a<c
If a=b and b=c, then a=c

D = {Rationals}   D = {Counting}   D = {Integers}
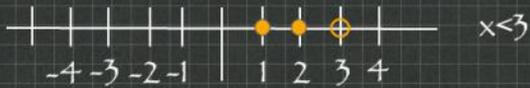
Drag and Drop   Submit

x<3

x > 4
and
x ≤ 1

x≥-3
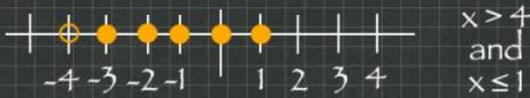
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