

NAME _____

CLASS PERIOD _____

LINEAR TOPICS – Notes and Homework: DUE ON EXAM

VOCABULARY: Make sure you know the definitions of the terms listed below. These will be covered on the exam.

Axis "b" Coordinate points Continuous graph Constant Correlation Dependent Variable Direct Variation Discrete graph Domain Displacement Function f(x) Independent Variable Linear Line of Best Fit "m" Midpoint	Parent Functions Parent graph Absolute Value Quadratic Non Proportionate equation Origin Parallel Perpendicular Predictor Proportionate Equation "k" Quadrants Range (graphing) Rate of Change Reflection Regression Rotation	Scatter plot Slope Slope Intercept Form Standard Form Translation Trend Variable Vertical Line Test Vertices (vertex) X Intercept Y Intercept MEASURE OF CENTRAL TENDANCY Mean Measure Central Tendency (MCT) Median Mode Range (MCT)
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Function: A relationship in which every input (x) is paired with exactly 1 output (y). The input is the independent set (x), **x** is unique, there are no repeaters.

The output or dependent variable is y.

Other terms for "y": f(x), f(a), or f(any variable that is in the equation)

Examples of functions: List "b", the y intercept (wait to identify the slope, m)

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Slope-intercept form:

The y-intercept:

- "b" is the y-intercept. The y-intercept is the point where the graph goes through the y-axis!
- "b" is a number. *There is NEVER a letter next to it!!!!*
- If an equation does not have a "b", then the graph goes through the origin. (0,0)
- The y intercept coordinate point ALWAYS~ starts with a zero.

In the above equations, circle "b" and write "b" as a coordinate point.

Slope:

- m is the SLOPE
- **m** is always next to the variable x (coefficient). No exceptions.
- Slope means the slant of the line. The value of the slope will indicate how steep or how flat the line is.
- _____



There is NO excuse on a TAKS test to forget that slope is y over x. On the formula chart, it gives the slope formula that shows it is y over x. Do not guess...look it up.

Examples:

- slope is POSITIVE
- slope is NEGATIVE
- Is there a variable x? No, slope is ZERO. We really have
The line is horizontal
- There is no "y". There is no slope. This is a vertical line thus, the slope is undefined! This is not a function.

NOW: Go back to the first page and write the slope of each function down.

How do we tell if a graph is a function?

It must pass the **vertical line test**. If you draw a vertical line on any graph, it cannot touch two points or cut through the line/curve. If it does, it is NOT a function. In other words, no two points can have the same "X" value.

GRAPHING LINEAR EQUATIONS

For the following equations put a box around the slope and circle the y-intercept. Remember, slope is a number. *It does not contain a variable!!! Slope is the coefficient/number next to the x variable.* The- y-intercept is a constant; it never has a variable next to it!!!

If necessary put in equation into slope intercept form. Once in slope intercept form they are graphing ready.

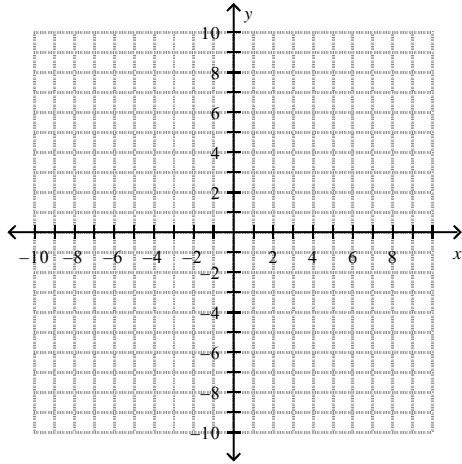
STEPS TO GRAPH:

1. Get the equation into _____ form
2. Find the y-intercept and mark it on the graph
3. Start at the y-intercept and follow your rise over run to the second point.
Connect the dots.
4. If the equation has no y-intercept, where do you start? What is the y-intercept when none is present? _____

HOMEWORK DUE EXAM DAY Graph remember to ID slope and y-intercept

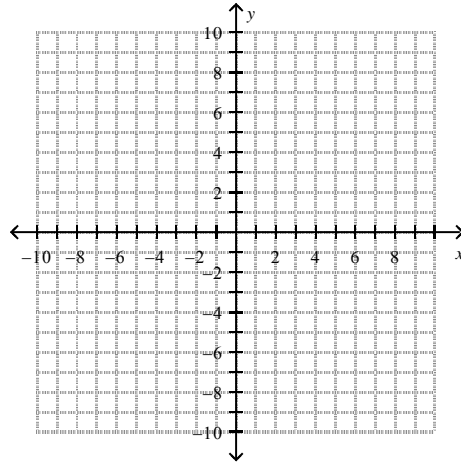
1. -

m= _____ b= _____



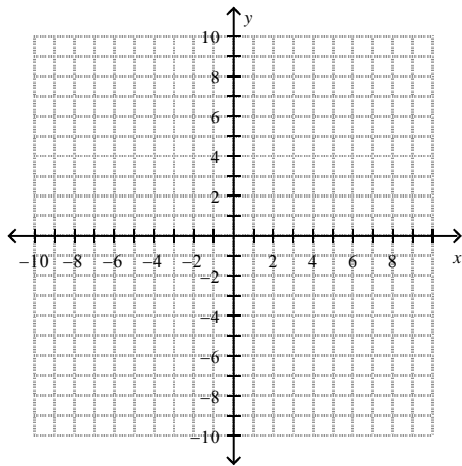
2.

m= _____ b= _____



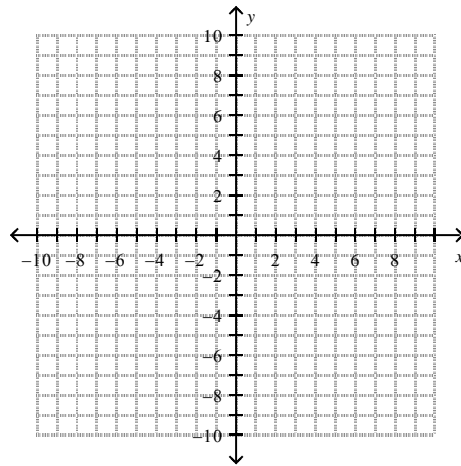
3. -

m= _____ b= _____



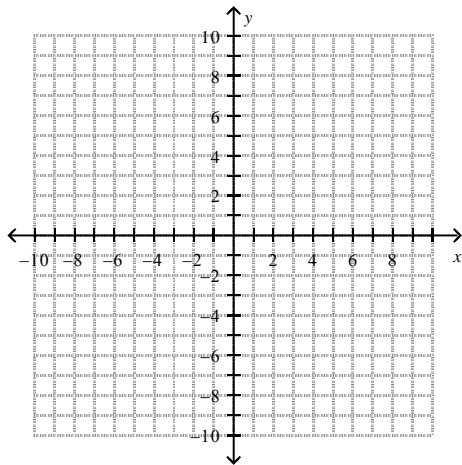
4.

m= _____ b= _____



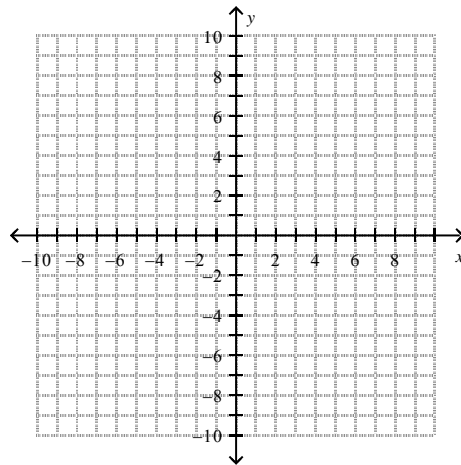
5.

m= _____ b= _____



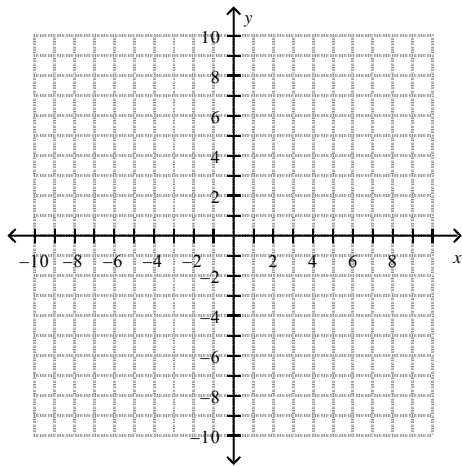
6.

m= _____ b= _____



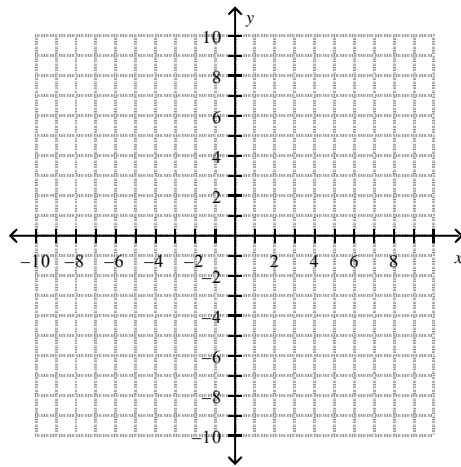
7.

m= _____ b= _____



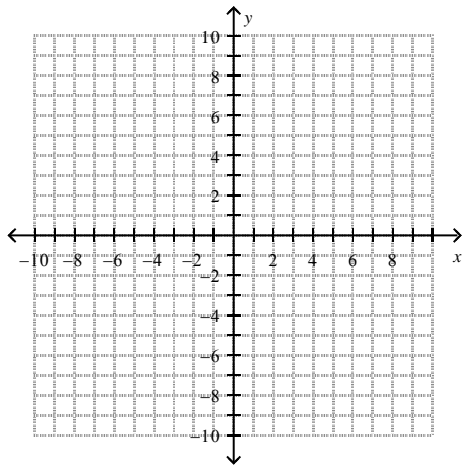
8.

m= _____ b= _____



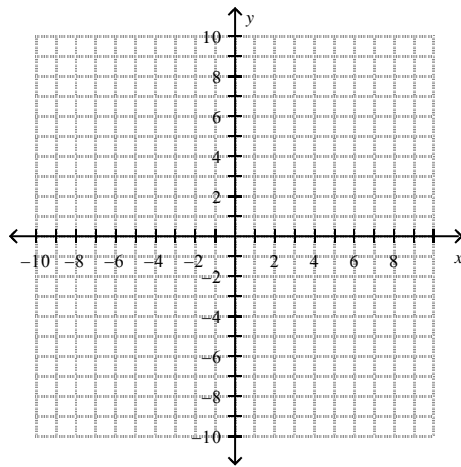
9.

m= _____ b= _____



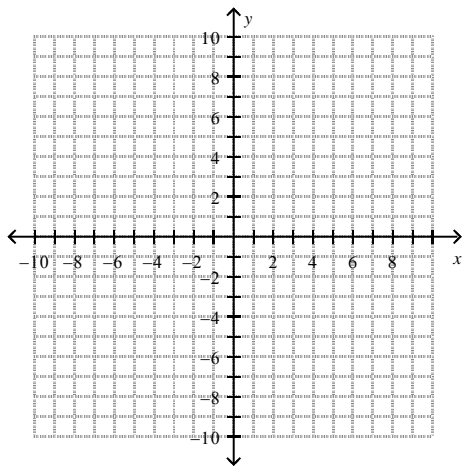
10.

m= _____ b= _____



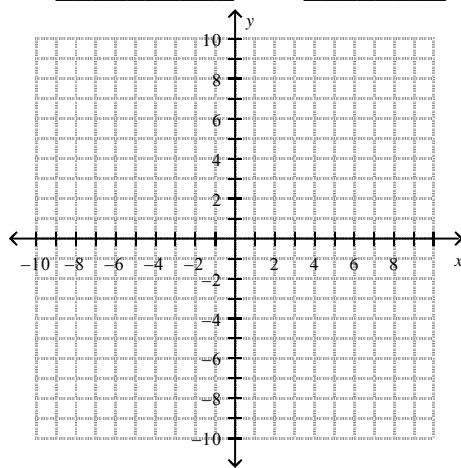
11.

m= _____ b= _____



12.

m= _____ b= _____



Quadrants:

Shaped like a C II I
 III IV

Label the graph above.

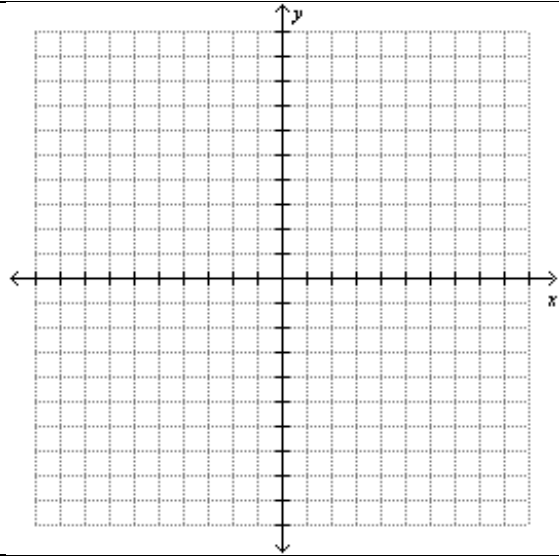
In quad I x values are ___ and y values are ___ (,)

In quad II the x values are ___ and they values are ___ (,)

In quad III x values are ___ and y values are ___ (,)

In quad IV the x values are ___ and they values are ___ (,)

Label on the graph



Domain and range.

Continuous graph (adjacent)

()

Find the smallest x _____

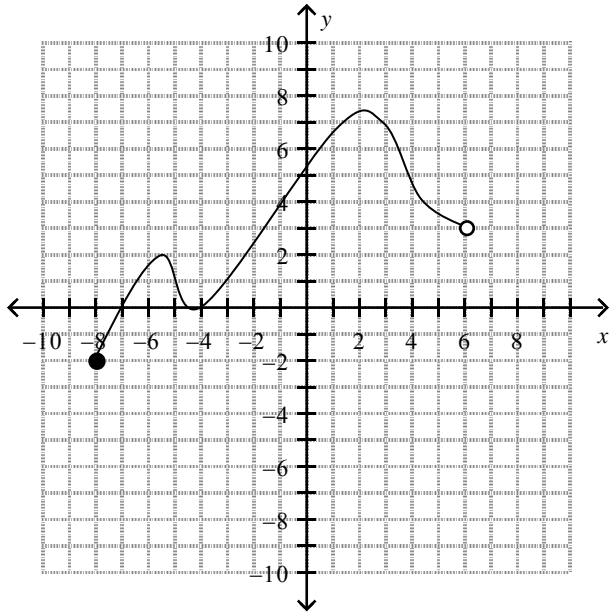
Find the largest x _____

Domain: < x < *equal sign needed?*

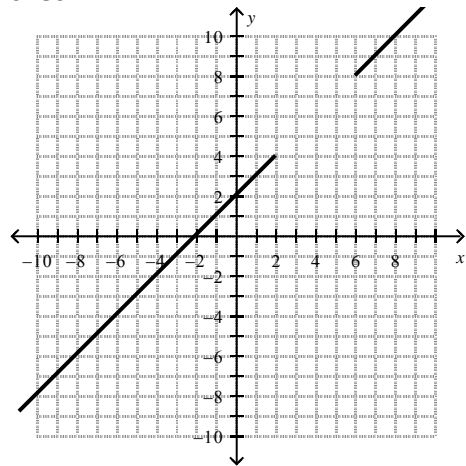
If your point is a an open circle, you do not put an = sign under the inequality. If the point is a has a filled in circle (or if it touches the point), put the = sign under the < .

Do the same for the y values, range:

low y _____ high y _____ *equal sign needed?*



Discrete graph: There are breaks in the graph, may be just points of a break



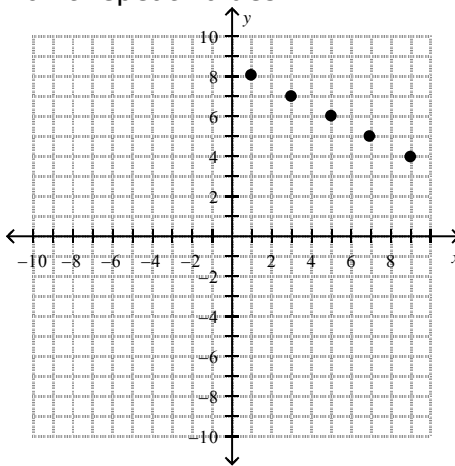
domain=

range=

On scatter plots, you just list your points.

{ x = }, { y = }

Don't repeat values

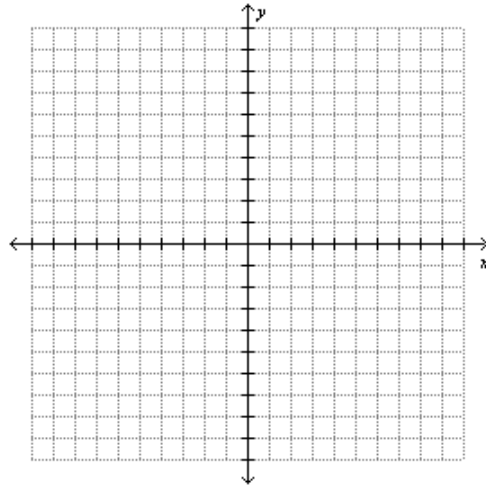


domain=

range=

Reflection vs. Rotation

Graph the following and label:



What is the slope of _____ ? _____

How did the graphs of _____ compare? _____

How did the graph of _____ compare? _____

How did the graph of _____ compare? _____

How did the graph of _____ compare, which is steeper? _____

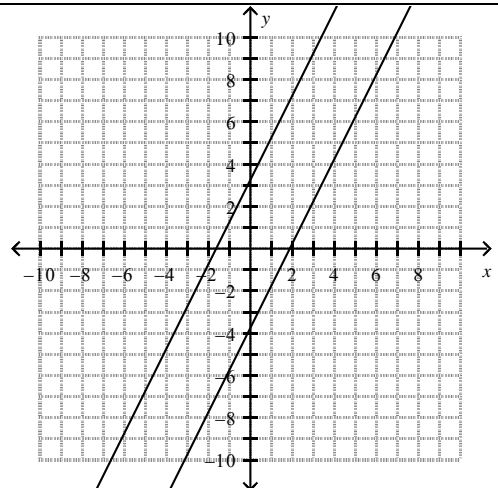
What conclusion can you draw about the effect of a slope where the absolute value is less than 1 (fraction) and a slope where the absolute value is larger than 1 on a graph? _____

So, the effect of changing the slope on a line graph is called a _____

Parallel and Perpendicular Lines

What do you see with the adjacent lines?

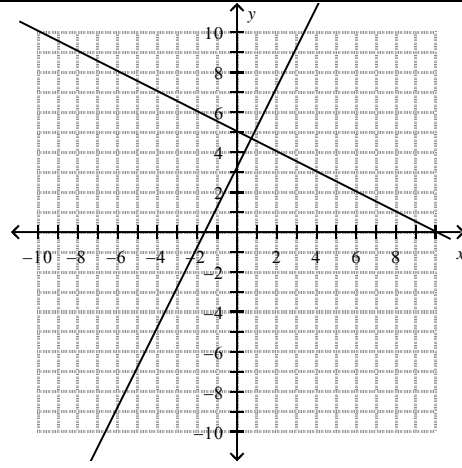
Parallel lines have the same slope, different y-intercepts:



What do you see with the adjacent lines?

Perpendicular lines have slopes that are opposite and reciprocal of each other. The intercepts may or may not be the same. It is the slopes that are the key.

—



Graph

Did the slope change? _____

What did happen?

And when the slope does not change
the lines are _____

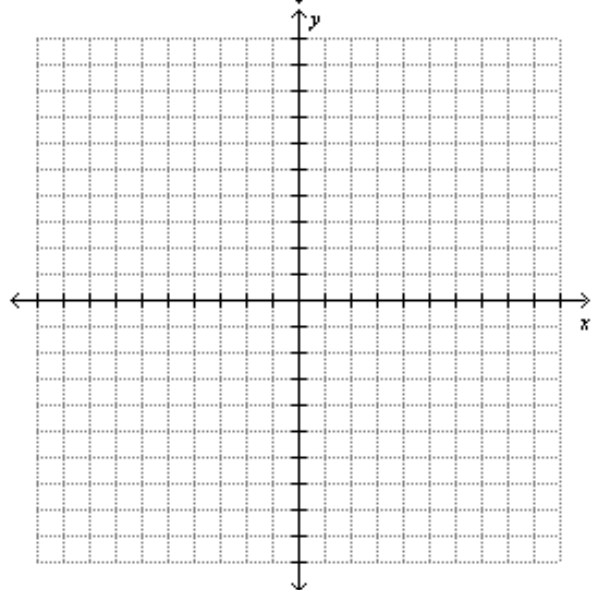
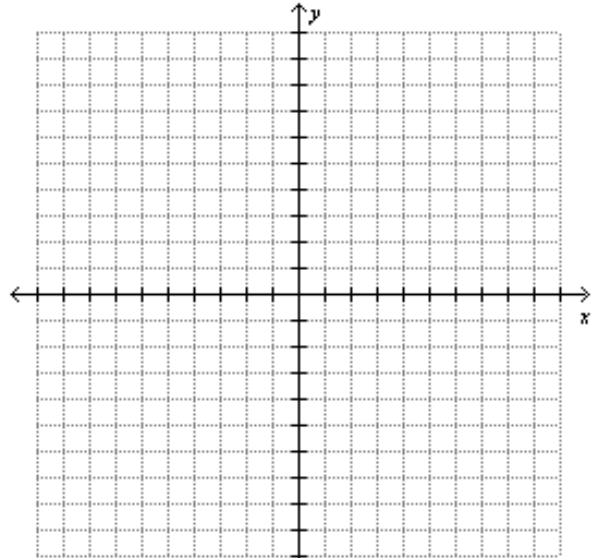
Graph

— — —

Did the slopes change between the first 2 lines? How?

What about the second set of lines?
The slopes are _____ and _____ of each other.

The lines are _____



SLOPE-INTERCEPT AND STANDARD FORM OF A LINEAR EQUATION

Standard Form:

Slope-Intercept Form

Standard form, both x and y are on one side of the equal sign. A number is on the other side. Solving standard form for y gets the equation in to y-intercept form.

Isolate the y term, subtract Ax from both sides
divide through by B (multiply by)

– – therefore, slope: – and the y-intercept: –

x-intercept (x, 0): here remember y=0 so when y=0,

–

Example: Identify A, B, and C in

First you need to get it into standard form: _____

A=_____ B=_____ C=_____ Slope=_____ y-intercept=_____

Can't remember all this? OK, just take the equation and put into the slope intercept form.

Example: Put into slope intercept form:

– –

Slope=_____ y-intercept=_____

HOMEWORK: Identify the slope and y-intercept. Show all work.

Parent functions: The simplest function with defining characteristics. That is a defining look. All functions of a family are transformations of their parent function.

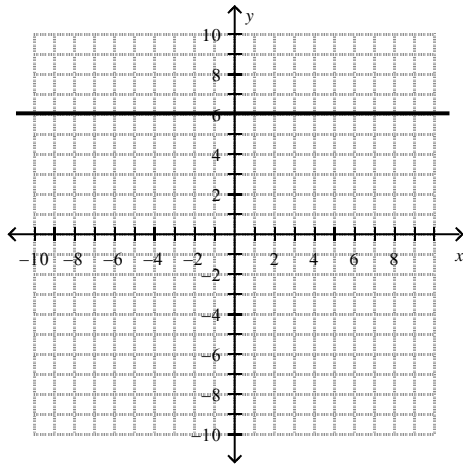
YOU MUST LEARN THESE. YOU WILL BE TESTED OVER AND OVER THESE GRAPHS

The parent graph of linear equations:

The parent quadratic graph is

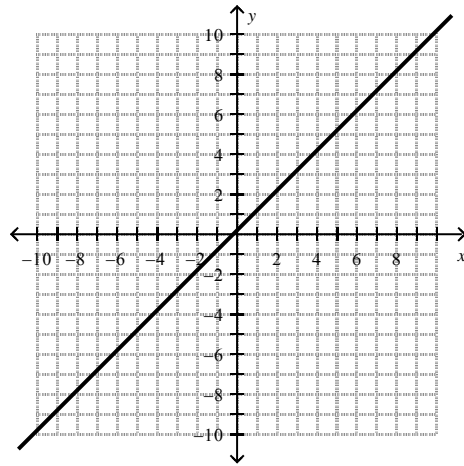
The parent absolute value is

Graph of a number, no x in the equation

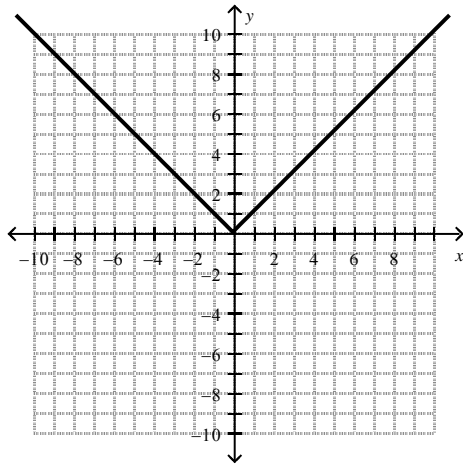


Why no x ? What is the slope $m = ?$ _____

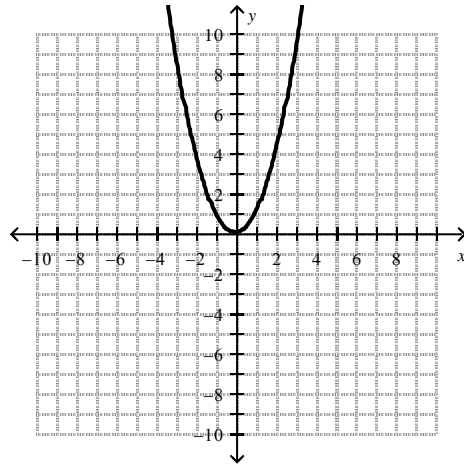
Parent linear function



Parent function of absolute value



Parent quadratic function



LINEAR BASICS – HOMEWORK

Due Exam Day!

Change from standard form to slope intercept form. State the slope and y-intercept.

1. y=_____	2. y=_____	3. y=_____
4. y=_____	5. y=_____	6. y=_____
7. y=_____	8. y=_____	9. y=_____

Put it all together (know how to do this page! you may see it on a quiz or test!)

- Label the Quadrants
- 2. Graph
- 3. Change the y intercept to 2 . Write your new equation _____ and graph it.
- The two graphs are _____
- 4. Using the new equation, change the slope to a negative . Write the new equation and graph it. _____ This graph is a _____ of the graph in #3.
- 5. Using the new equation, change the slope to -3 , write the new equation and graph it. _____
- 6. Using the new equation, change the y intercept to -3, write the new equation and graph it. _____ Lines in 5 and 6 are _____
- 7. Change _____ to slope intercept form

