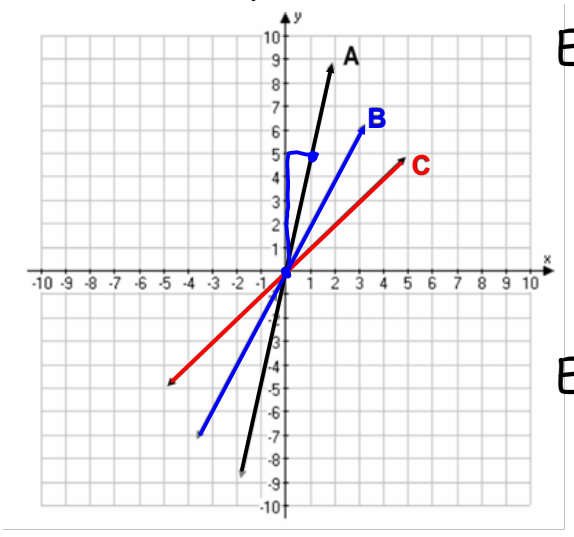
March 10, 2016

Linear Investigation

INVESTIGATION #1:

1. Find the equation of each line.



Equation of Line A

$b=0 \quad m=\frac{5}{1}=5$

$y=5x$

Equation of Line B

$m=\frac{4}{2}=\frac{2}{1}$ or 2

$b=0 \quad \therefore y=2x$

Equation of Line C

$m=\frac{3}{3}=1$

$b=0$

$y=1x$ or $y=x$

2. Which line is the steepest?

A

3. Which line is the least steep?

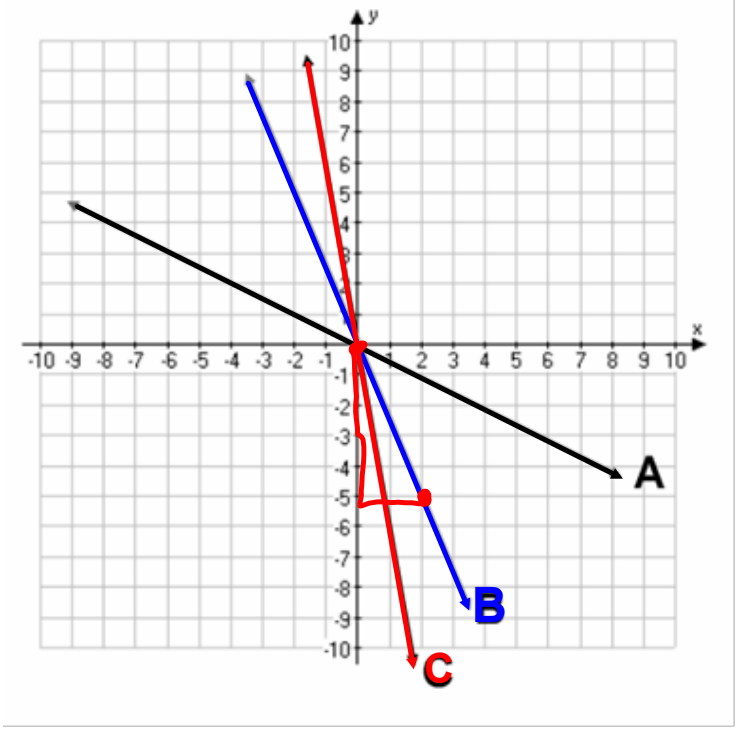
C

4. Make a general rule about the slope of lines.

-> larger the slope value, the steeper the line

INVESTIGATION #2:

1. Find the equation of each line.



Equation of Line A

$m = -\frac{1}{2}$

$b = 0$

$y = -\frac{1}{2}x$

Equation of Line B

$b = 0$ $m = -\frac{5}{2}$

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

Equation of Line C

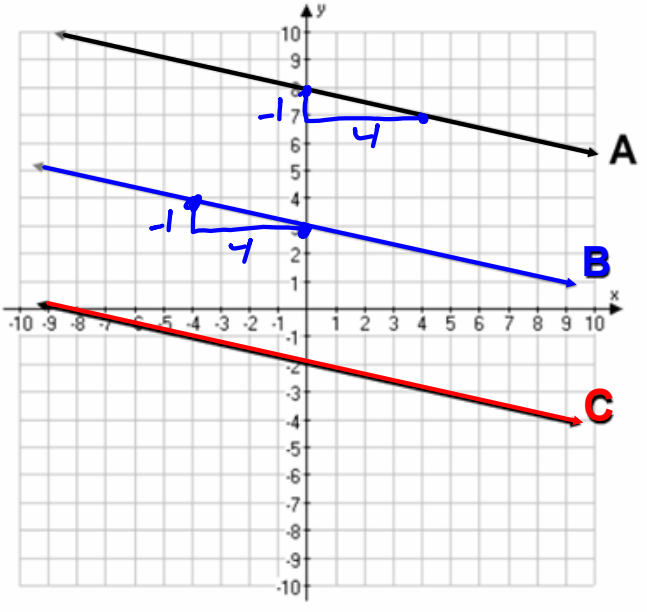
$b = 0$ $m = -\frac{6}{1}$ or -6

$y = -6x$

2. Make a general rule about the slope of lines. the larger the slope value (not including its sign), the steeper the line.

INVESTIGATION #3:

1. Find the equation of each line.



Equation of Line A

$y = -\frac{1}{4}x + 8$

Equation of Line B

$m = -\frac{1}{4}$ $b = 3$

$y = -\frac{1}{4}x + 3$

Equation of Line C

$y = -\frac{1}{4}x - 2$

2. What do you notice about the slopes of these lines?

They are the same!

3. Describe the relationship between lines that have the same slope.

lines are parallel

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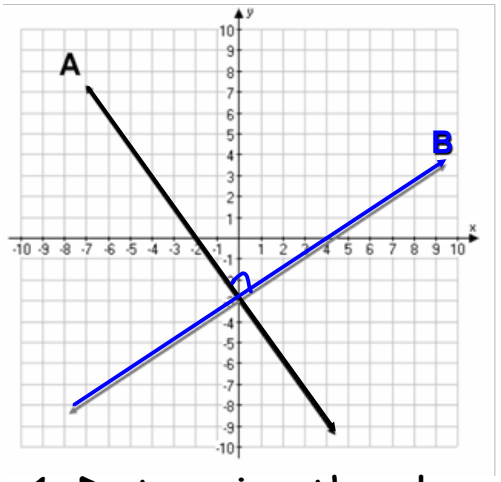
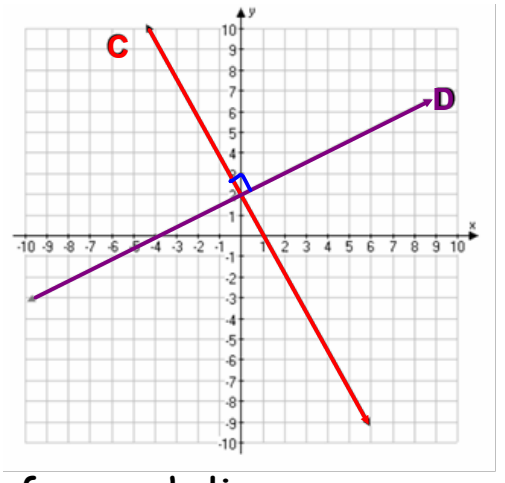
INVESTIGATION #4:





1. Determine the slopes for each line.

Line A	Line B	Line C	Line D
$m=\frac{-3}{2}$	$m=\frac{2}{3}$	$m=-2$	$m=\frac{1}{2}$

2. Determine the equation of each line.

Line A	Line B	Line C	Line D
$y=\frac{-3}{2}x-3$	$y=\frac{2}{3}x-3$	$y=-2x+2$	$y=\frac{1}{2}x+2$

3. What do you notice about the slopes of Lines A and B? What do you notice about the slopes of line C and D?

* Slopes are flipped and one is positive and one is negative
∴ negative reciprocals *

4. Describe the relationship between lines A and B and the relationship between lines C and D.

perpendicular.

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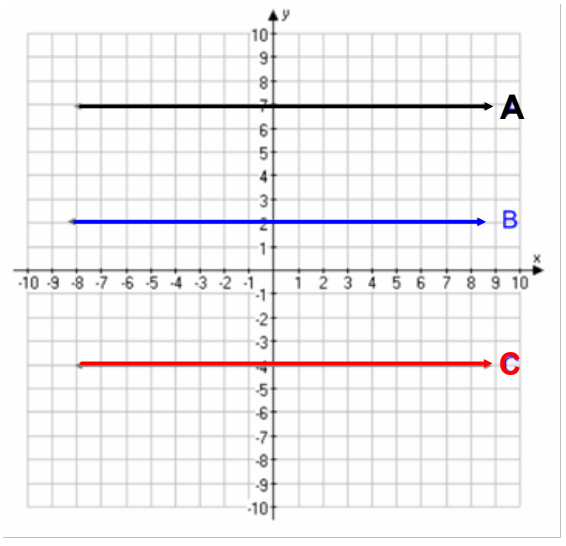
INVESTIGATION #5:

1. Find the slope of each line.



Slope of Line A

0

Slope of Line B

0

Slope of Line C

0

2. Determine the equation for each line.

Line A	Line B	Line C
$y=7$	$y=2$	$y=-4$

3. What do you notice about the slopes of these lines?

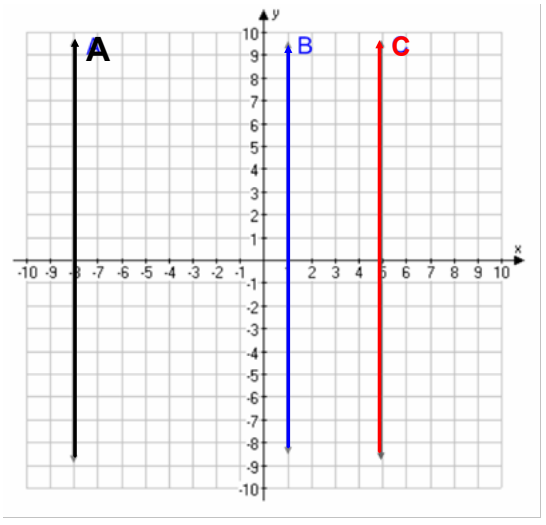
All 0

4. Make a general rule about the slope of horizontal lines.

Slope is zero

INVESTIGATION #6:

1. Find the equation of each line.



Slope of Line A

undefined

Slope of Line B

undefined

Slope of Line C

undefined

2. Determine the equation for each line.

Line A: $x = -8$

Line B: $x = 1$

Line C: $x = 5$

3. What do you notice about the slopes of these lines?

undefined

4. Make a general rule about the slope of vertical lines.

undefined

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KEY IDEAS

1. The greater / larger the slope the **steeper** the line (NOT including the sign)

2. The smaller / lesser the slope the more **gradual** (less steep) the line(NOT including the sign)

3. parallel lines have the **same** slope

4. The slopes of perpendicular lines are **flipped** and the signs are **switched!**

5. horizontal lines have a slope of **zero** Their equation is where the line crosses the y-axis (Eq'n is y=#)

6. Vertical lines have slopes that are **undefined.** Their equation is where the line crosses the x-axis (Eq'n is x=#)

HOMEWORK:

Parallel, Perpendicular, Horizontal and Vertical Lines Hanout: – odd #'s

Part A, Part B and Part C