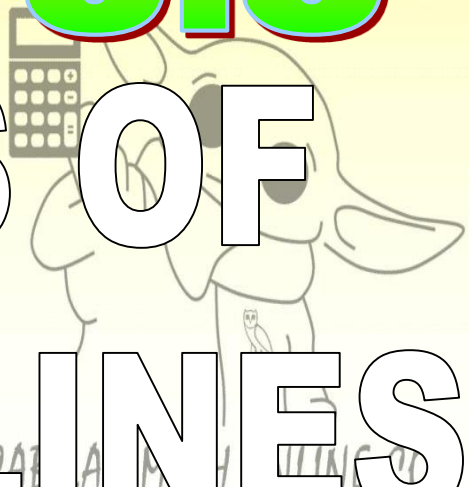
ST. JEAN DE BREBEUF
MATHEMATICS

CHAPTER 3.3

PROPERTIES OF SLOPES and LINES



CHAPTER 3.3 PROPERTIES OF SLOPES and LINES

KEY CONCEPTS

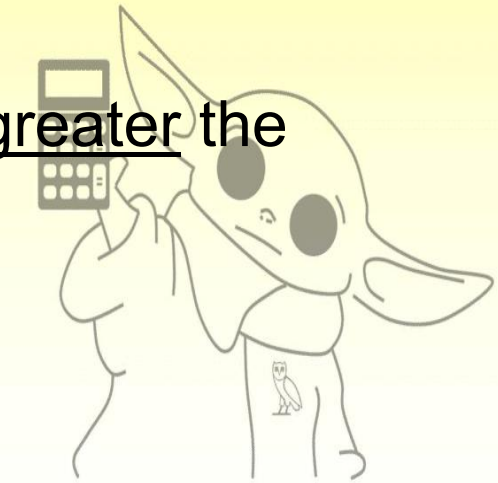
A line with a positive slope goes **up** from left to right
A line with a negative slope goes **down** from left to right.

A horizontal line has a slope of **zero**.

Parallel lines have the **same slope**.

Lines that do not touch or meet

Ignoring the sign on the coefficient of *x*, the greater the coefficient of *x*, the **steeper** the line.

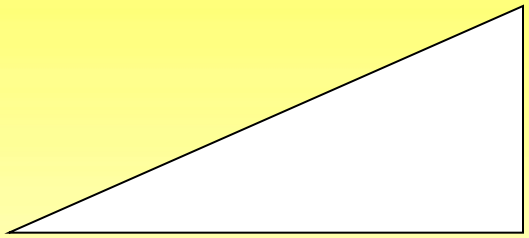


CHAPTER 3.3 PROPERTIES OF SLOPES and LINES

EXAMPLE 1 *Positive and Negative Slopes*

Determine the slope of each object.

(a)



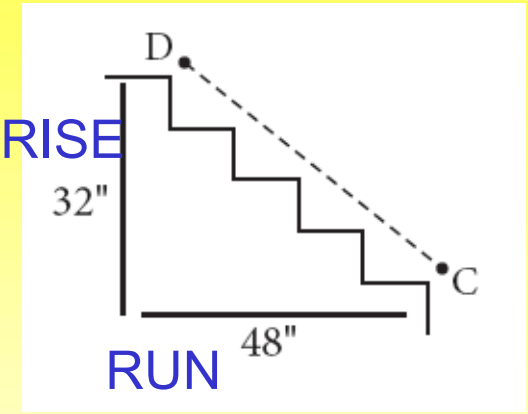
Since this is going **up** to the right, this will be a positive slope

$$slope = \frac{rise}{run}$$

$$slope = \frac{50}{100}$$ * Reduce to lowest terms

$$slope = \frac{1}{2}$$

(b)



Since this is going **down** to the right, this will be a negative slope

$$slope = \frac{rise}{run}$$

$$slope = -\frac{32}{48}$$ * Reduce to lowest terms

$$slope = -\frac{2}{3}$$

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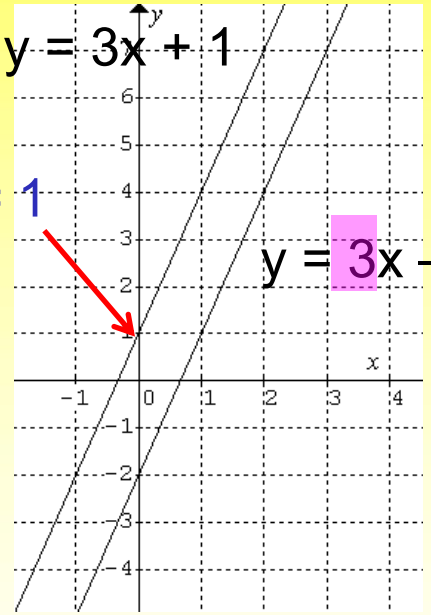
EXAMPLE 2 *Parallel Lines*

Write the equation of the line that is parallel to each line (recall that parallel lines have the **same** slope!)

(a)



Recall:

$y = mx + b$

m = slope

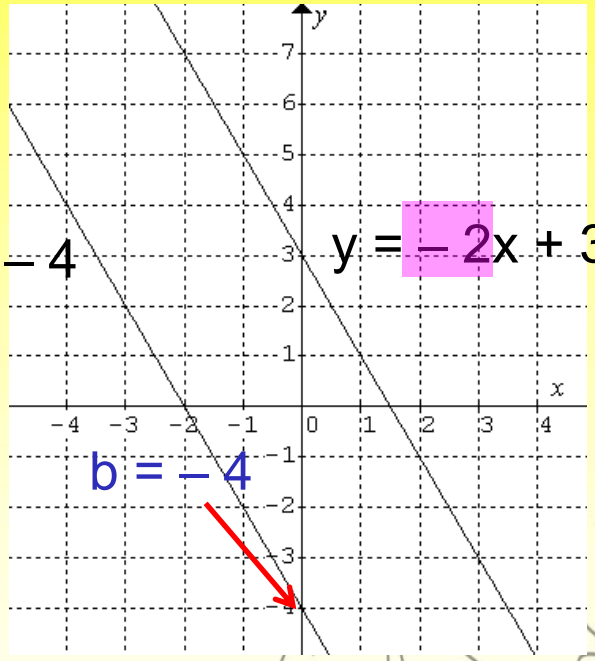
b = y-intercept

$y = mx + b$

$y = 3x + b$

$y = 3x + 1$

(b)



$y = mx + b$

$y = -2x + b$

$y = -2x + (-4)$

$y = -2x - 4$

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EXAMPLE 3 *Determining Which Equation is Steeper*

Ignoring the sign on the coefficient of x, the greater the coefficient of x the **steeper** the line.

For each pair of equations, determine which equation represents a **steeper** slope and provide an explanation

EQUATIONS	EXPLANATION
$y = 2x + 7$ $y = 5x - 3$	Slope of **5** is steeper because it is *further* away from **0**
$y = -3x + 2$ $y = x - 1$ Slope = **1**	Although the slope is *negative*, slope of **– 3** is steeper because it is further away from **0**
$y = -8x + 2$ $y = 8x + 3$	NEITHER!!! →They have the same steepness but are only different in direction →Slope of **– 8** and **8** are the same distance away from **0**

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