

Your name

Mrs. Theo

8/30/21

Notes

Slopes of // and \perp Lines

Slope-Intercept Form

$$y = \underline{m}x + \underline{b}$$

- Slope
- Rate of change (per)
- Coefficient
- y -intercept
- Initial "value"
- Constant

Methods of Finding Slope

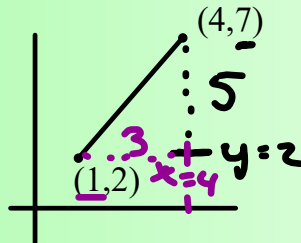
- Slope Formula $m = \frac{y_2 - y_1}{x_2 - x_1}$

Ex: ^{1st point} (1,2) and ^{2nd point} (4,7)
 x_1, y_1 x_2, y_2

$$m = \frac{2 - 7}{1 - 4} = \frac{-5}{-3} = \frac{5}{3}$$

- Graphical Method

$$\frac{\text{Rise}}{\text{Run}}$$



$$m = \frac{5}{3}$$

- Stack Method

$$\frac{\text{Rise}}{\text{Run}}$$

(1,2)

(4,7)

Slopes

- Parallel Lines
- Perpendicular Lines

Same slope

Slopes are opposite reciprocals

Sign (negative) Flip the Fraction

Fill in the missing slopes in the table below.

Slope	Slope of Parallel Line	Slope of Perpendicular Line
$\frac{2}{3}$	$\frac{2}{3}$	$-\frac{3}{2}$
-5	$-5 = \frac{-5}{1} = \frac{5}{-1}$	$\frac{1}{5}$
$4\frac{1}{5}$	$4\frac{1}{5} = \frac{21}{5} = \frac{-21}{-5}$	$-\frac{5}{21}$
$1.6 = \frac{1.6}{1}$	$1.6 = \frac{16}{10} = \frac{16}{5}$	$-\frac{5}{8}$ or $-\frac{1}{1.6}$

ACT/SAT Example

Which two lines are perpendicular?

~~F~~ $y = -5x + 2$ and $2y - 10x = 4$

$2y = 10x + 4$ Parallels
 $y = 5x + 2$ $m = 5$

~~G~~ $y = \frac{1}{4}x + 1$ and $y = 4x + 2$

both positive

~~H~~ $y = 3x + 1$ and $y - 4x = 6$

$m = 3$

$y = 4x + 6$
 $m = 4$

~~I~~ $y = \frac{1}{2}x + 2$ and $y + 2x = -4$

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

$y = -2x - 4$
 $m = -2$

Mental Floss

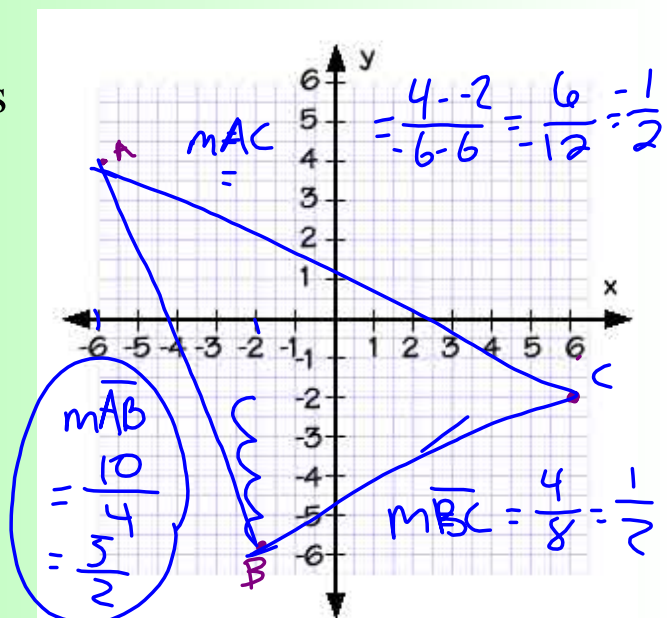
a.) Plot the following points on a coordinate grid.

$A(-6, 4)$

$B(-2, -6)$

$C(6, -2)$

b.) Find the slopes of all 3 sides of triangle ABC.



c.) Is triangle ABC a right triangle? Justify your answer.

No, because none of the slopes are perpendicular (opposite and reciprocals)

Mental Floss - Wed Jan 6th

- 1.) Find the slope of the line passing through the points (1,-3) and (-2,6).

$$m = \frac{-3-6}{1-(-2)} = \frac{-9}{3} = \boxed{-3} = m$$

- 2.) Write an equation in slope-intercept form of the line that passes through the points from #1.

$$y = mx + b \quad -3 = (-3)(1) + b \quad y = -3x + 0$$

USE EITHER PT. $-3 = -3 + b \quad \underline{b=0} \quad \boxed{y = -3x}$

- 3.) Write the equation from #2 in standard form.

$$y = -3x$$

$$\boxed{3x + y = 0}$$

$$\underline{Ax + By = C}$$

- 4.) Write an equation in slope-intercept form of any line that is perpendicular to the equation from #2 =

SLOPES \rightarrow opp recip

$$y = \frac{1}{3}x + \text{ANY CONSTANT}$$