

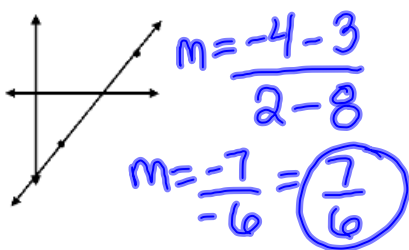
*Section 1.2: Slope of a line***SLOPE**

- Measures steepness of a line in relation to the x-axis
- Slope = $\frac{\text{change in } y}{\text{change in } x} = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{y_1 - y_2}{x_1 - x_2}$
- Slope is constant (same value) between any 2 points

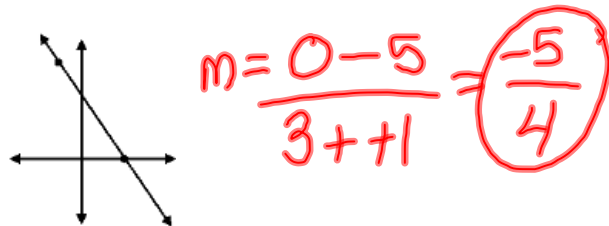
Examples

Find the slope of the line passing through the given points.

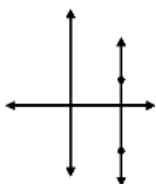
1) $\begin{matrix} x & y & & x & y \\ (2, -4) & \text{and} & (8, 3) \end{matrix}$



2) $(-1, 5) \text{ and } (3, 0)$



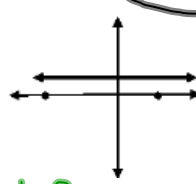
3) $(4, 2) \text{ and } (4, -3)$



$$m = \frac{2 - (-3)}{4 - 4} = \frac{5}{0}$$

No slope or undefined

4) $(3, -1) \text{ and } (-4, -1)$



$$m = \frac{-1 - (-1)}{3 - (-4)} = \frac{0}{7} = 0$$

m = 0

Alg III 1.2 lesson

SLOPE-INTERCEPT FORM

$$y = mx + b \quad \text{or} \quad y = mx + k$$

m = slope b = y-intercept

Example 5

What is the slope and y-intercept of $5x + 3y = -8$?

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

$$\begin{aligned} -9x & \quad -5x \\ \frac{3y}{3} & = \frac{-5x - 8}{3} & y & = -\frac{5}{3}x - \frac{8}{3} \end{aligned}$$

Parallel Lines: have equal slopes

Perpendicular Lines: have slopes that are the opposite reciprocals

Ex: If line A and line B are perpendicular and line A has $m = -2$
then line B has $m = \frac{1}{2}$

Example 6

Which lines are parallel? Perpendicular?

Line A

$$y = \frac{3}{4}x + 5$$

$$m = \frac{3}{4}$$

Line B

$$4x + 3y = 3$$

$$\begin{aligned} \frac{3y}{3} & = \frac{-4x + 3}{3} \\ y & = -\frac{4}{3}x + 1 \end{aligned}$$

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

Line C

$$3x - 4y = 5$$

$$\begin{aligned} -4y & = -3x + 5 \\ \frac{-4y}{-4} & = \frac{-3x + 5}{-4} \\ y & = \frac{3}{4}x - \frac{5}{4} \end{aligned}$$

$$m = \frac{3}{4}$$

$A \perp B$

$A \parallel C$

$B \perp C$

HOMEWORK

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