Name
Adv Geo

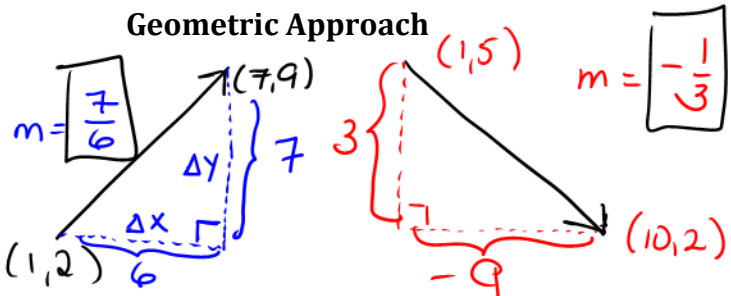
AMDG
4.6 Slope — LINEAR RATE OF CHANGE

Ms. Kresovic
Date

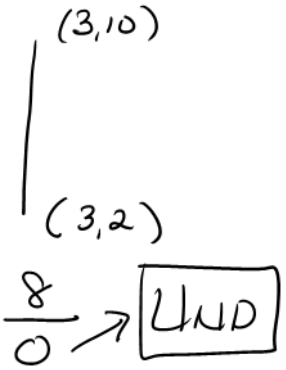
Algebraic Approach

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{\Delta y}{\Delta x} = \frac{\text{RISE}}{\text{RUN}}$$

Geometric Approach



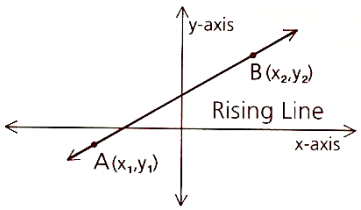
(4,3) (9,3) → 0/5 = 0



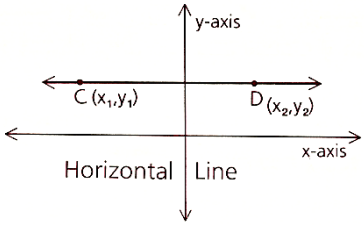
Visual Interpretation of Slope

The numerical value of a slope gives us a clue to the direction a line is taking. The following diagrams illustrate this notion.

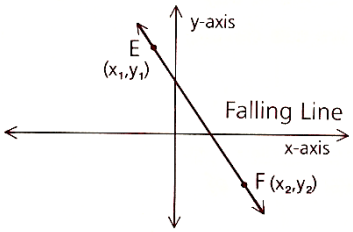
Positive Slope



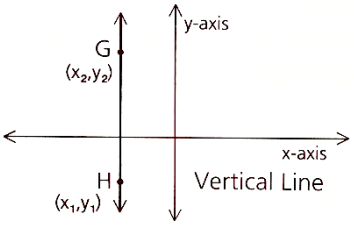
Zero Slope



Negative Slope



No Slope: UNDEFINED



In summary,
- Rising line ⇔ positive slope
- Horizontal line ⇔ zero slope
- Falling line ⇔ negative slope
- Vertical line ⇔ no slope

Parallel lines have = slopes

Perpendicular lines have OPPOSITE & RECIPROCAL slopes;

the product of the slopes is −1.

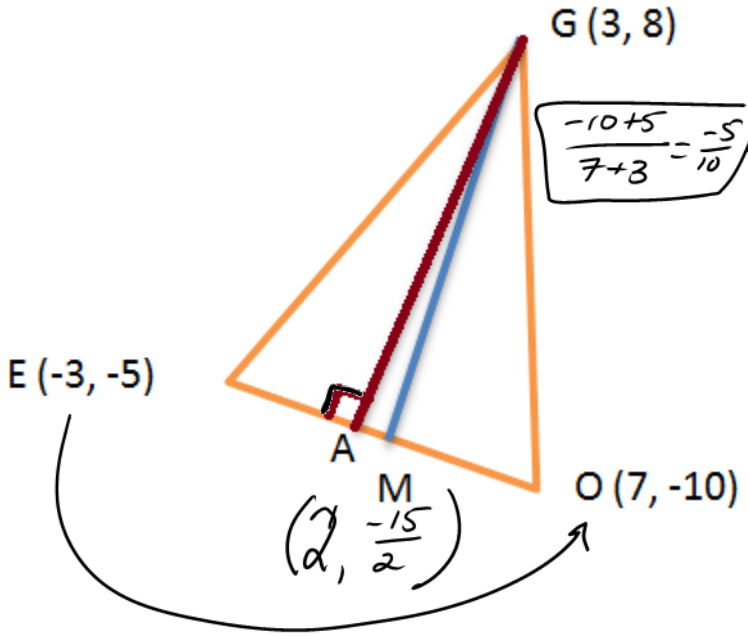
$\frac{11}{12}\left(-\frac{12}{11}\right) = -1$

AMDG

Name Ms. Kresovic

Adv Geo 4.6 Slope Date

Example 1:



a) Find slope EO

$\frac{-5+10}{-3-7} = \frac{5}{-10} = -\frac{1}{2}$

$\frac{-10+5}{7+3} = \frac{-5}{10}$

b) Slope GA

$GA \perp EO \therefore m_{GA} = -\left(-\frac{2}{1}\right) = 2$

c) Slope GM (m is midpt)

$\frac{\frac{16}{2}+\frac{15}{2}}{3-2} = \frac{\frac{31}{2}}{1} = \frac{31}{2}$

d) Line through G || to EO

$-1/2$

Example 2: Slope $AB = 4/3$, $A(3, k)$ & $B(-7, 10)$. Find k.

$\frac{4}{3} = \frac{k-10}{3+7}$

$\frac{4}{3} = \frac{k-10}{10}$

$40 = 3(k-10)$

$40 = 3k - 30$

$70 = 3k$

$\frac{70}{3} = k$

AMDG

Name Ms. Kresovic

Adv Geo 4.6 Slope Date

Homework

1 Find the slope of the line determined by each pair of points.

a (1, 7) and (10, 15)

b $(-2, 6)$ and (5, 7)

c $(-8, -7)$ and $(-2, 4)$

d (5, 4) and $(-2, 4)$

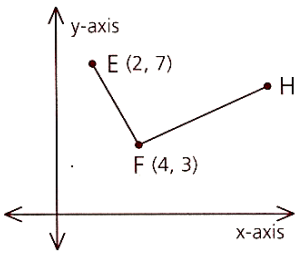
e $(\sqrt{3}, 7)$ and $(\sqrt{3}, -9)$

f $(5a, 6c)$ and $(2a, -9c)$

2 $\overleftrightarrow{AB}$ has a slope of $1\frac{2}{3}$ and $\overleftrightarrow{CD} \perp \overleftrightarrow{AB}$. What is the slope of $\overleftrightarrow{CD}$?

3 If $\overleftrightarrow{EF} \parallel \overleftrightarrow{GH}$ and $\overleftrightarrow{EF}$ has a slope of -4, what is the slope of $\overleftrightarrow{GH}$?

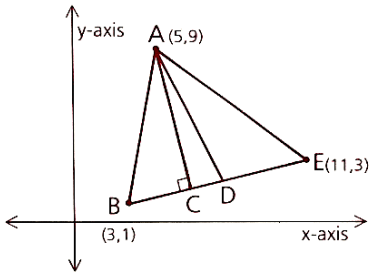
4 If $\angle F$ is a right angle, find the slope of $\overleftrightarrow{FH}$.



5 Given the diagram as marked, with $\overline{AC}$ an altitude and $\overline{AD}$ a median, find the slope of each line.

a $\overleftrightarrow{BE}$ **b** $\overleftrightarrow{AC}$ **c** $\overleftrightarrow{AD}$

d A line through A and parallel to $\overline{BE}$



6 $\overleftrightarrow{AB}$ has a slope of $2\frac{1}{2}$. If A = (2, 7) and B = (12, k), what is the value of k?