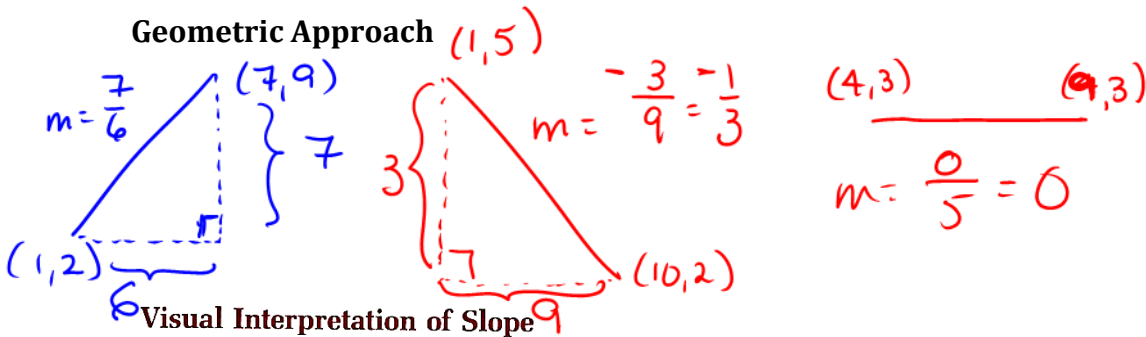


**Algebraic Approach**

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

← vert  
← horiz

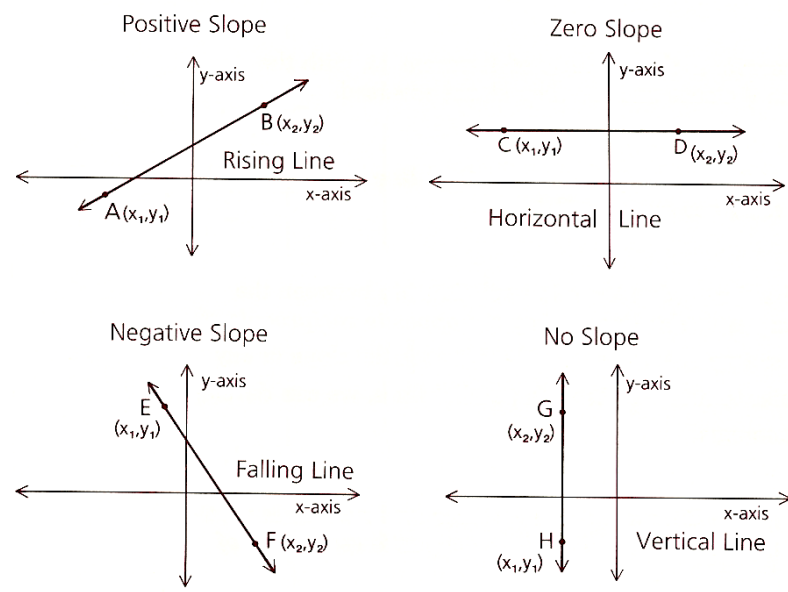
**Geometric Approach**



$(3,10)$   
 $(3,2)$   
 $\frac{8}{0} = \text{UNDEF.}$

**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.



- In summary,
- Rising line  $\Leftrightarrow$  positive slope
  - Horizontal line  $\Leftrightarrow$  zero slope
  - Falling line  $\Leftrightarrow$  negative slope
  - Vertical line  $\Leftrightarrow$  no slope

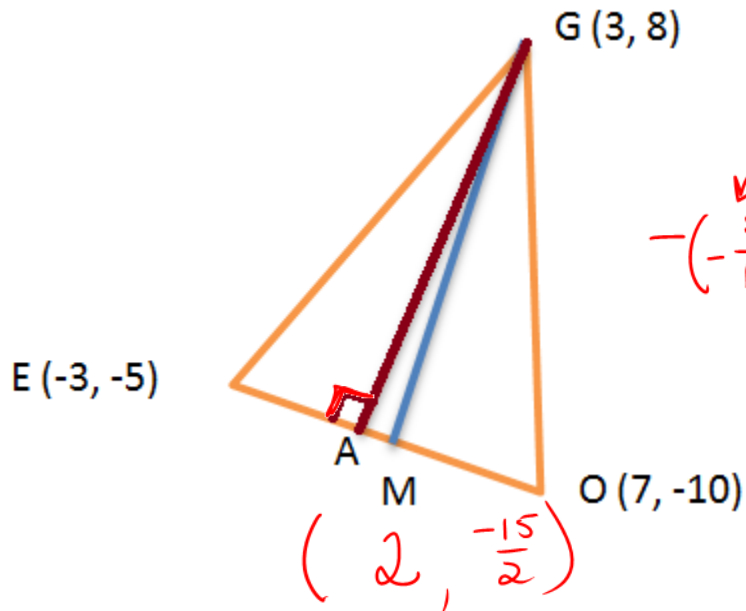
Parallel lines have     =     slopes

Perpendicular lines have     **OPPOSITE & RECIPROCAL**     slopes;

the product of the slopes is     -1    .

Ex:  $5 \left(-\frac{1}{5}\right) = -1$

**Example 1:**



a) Find slope  $EO$

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

b) Slope  $GA$

$$-\left(-\frac{2}{1}\right) = 2$$

c) Slope  $GM$

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

d) Line through  $G$   $\parallel$  to  $EO$

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

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

$$\frac{4}{3} = \frac{k-10}{3+7} \quad ; \quad \frac{4}{3} = \frac{k-10}{10} \quad ; \quad 40 = 3(k-10)$$

$$40 = 3k - 30$$

$$70 = 3k$$

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

### Homework

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

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

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

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

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

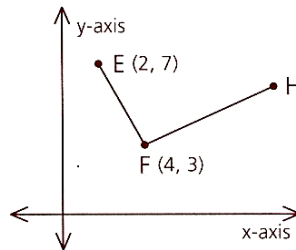
c (-8, -7) and (-2, 4)

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  $\overleftrightarrow{FH}$ .

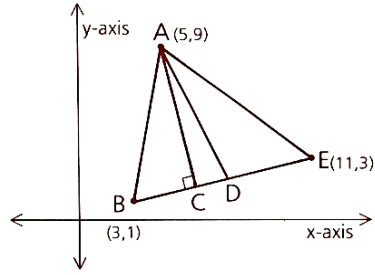


AMDG

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  $\overleftrightarrow{BE}$



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