## 3.1 Slope of a Line

**Warm-Up**

Simplify the following.

$\frac{12}{15}$ $\frac{8+(-2)}{-3-9}$ $\frac{-8-(-2)}{3+(-9)}$

| Main Topic | Slope of a Line |
|---|---|

Let's assume you are the pilot of a flight heading to Greensboro, North Carolina, then you received a message from an air traffic controller that the runway is ready for your aircraft to takeoff.

- ☐ Draw an airport tower on the lower right side of the grid.
- ☐ Draw a plane on the lower left side of the grid.
- ☐ From the plane, draw a takeoff path.
  (make sure that the path crosses at least 2 corners of the squares)
- ☐ Locate two points on the path, label, and identify the coordinates of the points.



Need Help?

Do you know how to represent the steepness of the path in numerical form?
If not, follow the additional instructions below.

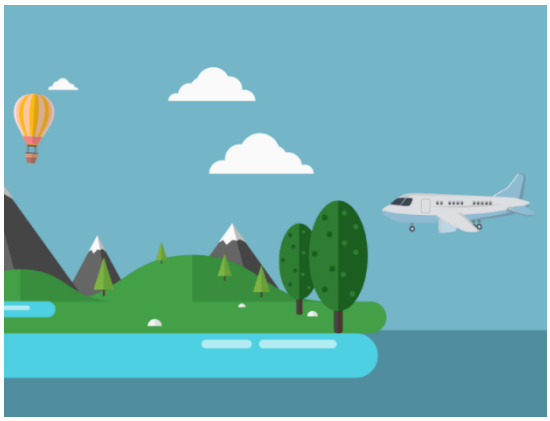
- ☐ Using two points from the graph, identify the 3rd point to create a right triangle when the points are connected.
- ☐ Determine the length of the height of the triangle then label it.
- ☐ Determine the length of the base of the triangle then label it.

**Slope**

$\frac{height}{base} = \_\_\_\_\_$ When the aircraft reaches _____ above the ground, it covers _____ horizontal distance from the takeoff point.

- ☐ If the line is diagonal to the right (**increasing**), the *slope* is **positive**.
- ☐ If the line is diagonal to the left (**decreasing**), the *slope* is **negative**.

**After several hours of flying, it's time for landing.**



- ☐ Draw an airport tower on the lower left side of the grid.
- ☐ Draw a plane on the upper right side of the grid.
- ☐ From the plane, draw a straight landing path.
  (make sure that the path crosses at least 2 corners of the squares)
- ☐ Locate two points on the path, label, and identify the coordinates of the points.

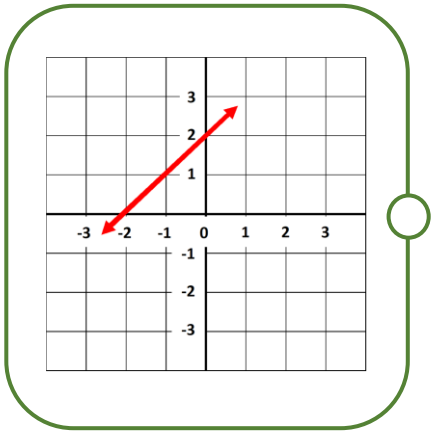
What is the slope of the landing path?

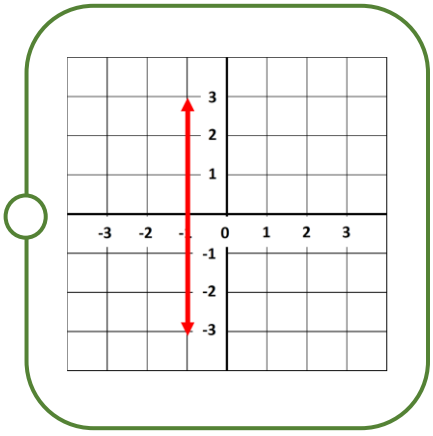
Need Help?

## Matching

Match the graphs with the slopes in the middle column by connecting the shapes.

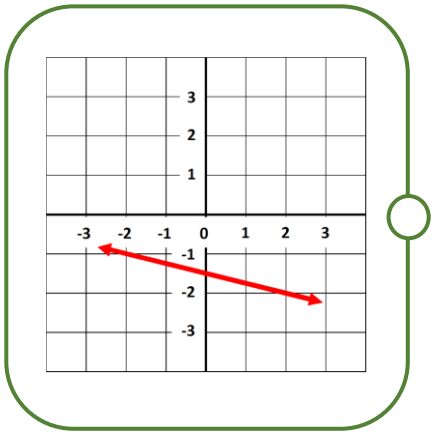
**Column A** **Column B**



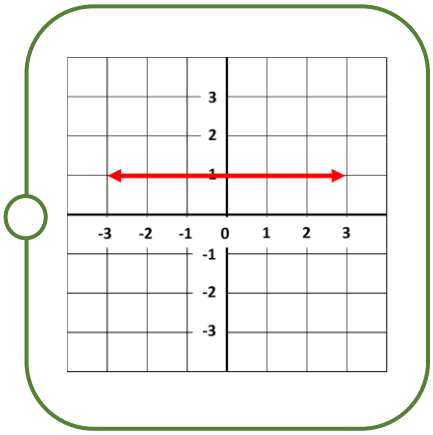

$m = 0$

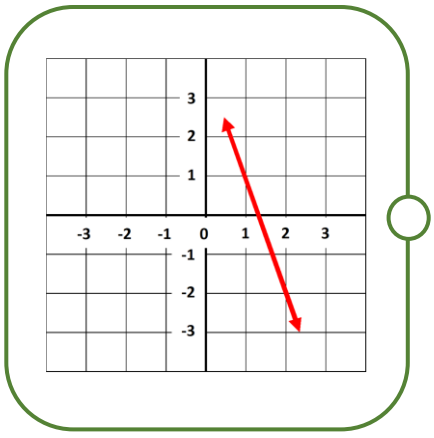
$m = Undefined$




$m = -\frac{1}{4}$

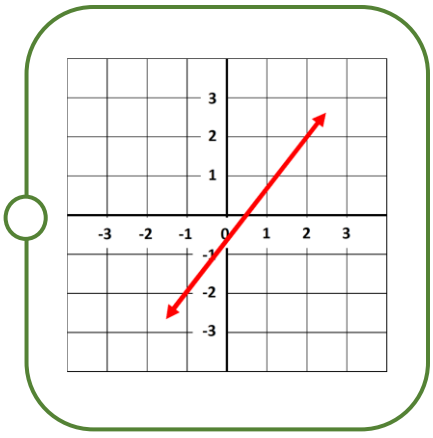
$m = -3$




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

$m = 1$

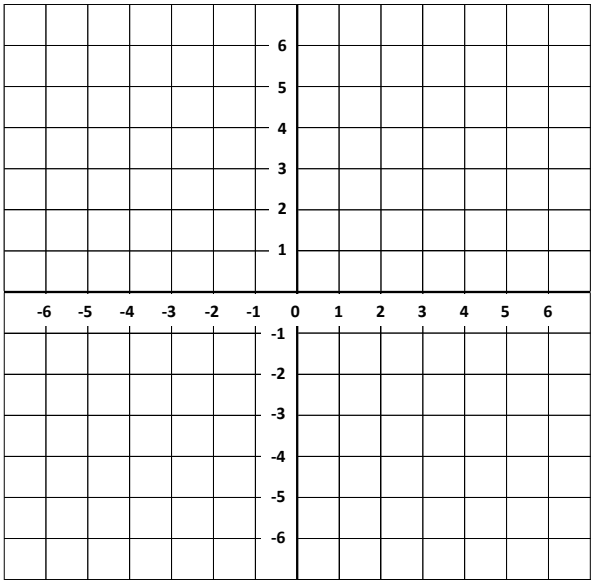


**Main Topic** **Slope of a Line Passing Two Points**

Find the slope of a line that passes through the points below.

| P(-1, -2) and Q(0, 2) | A(-2,3) and B(1, 0) | S(1, -1) and T(-1, -1) |
|---|---|---|

- Plot points A(-4, -2) and B(3, 5).
- Plot point C( , ) in the 2nd quadrant to create a right triangle.
- What is the length of the height (rise) of the triangle?
- Height (rise) Formula:
- What is the length of the base (run) of the triangle?
- Base (run) Formula:
- $Slope = \frac{Rise}{Run} =$ _____




**Slope**

Slope, ***m***, describes the direction and the steepness of a line.

Use the slope formula to find the slope of a line passing through the points below.

| P(-1, -2) and Q(0, 2) | A(-2,3) and B(-2, 0) | S(5, -1) and T(9, -1) |
|---|---|---|

Need Help?

Foldable

## Ready, Set, Go!

Find the slope of a line that passes through the given points.

### Ready

(2, 5) and (-8, 12)

Ask at least 2 classmates for assistance.

### Set

(-3, -16) and (4, -7)

Ask 1 classmate for assistance.

### Go

(20, -39) and (7, -23)

You got it and you can do it on your own!

## End-of-Course Prep