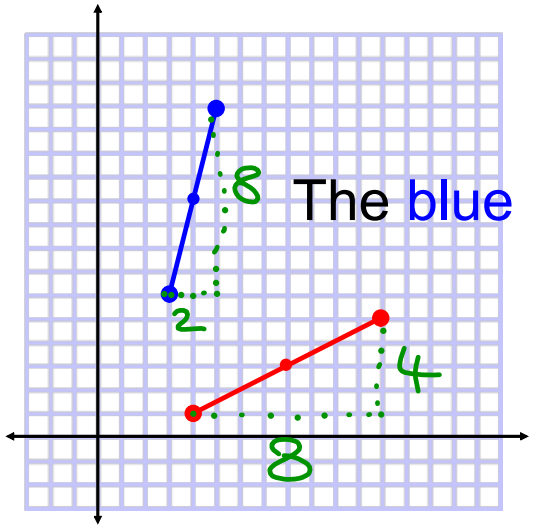
Which line segment is steeper? Determine the rate of change for each line segment. How does this support your initial answer?



The blue line is steeper

Rate of change $= \frac{8}{2}$

$= 4$

Rate of change $= \frac{4}{8}$

$= \frac{1}{2}$

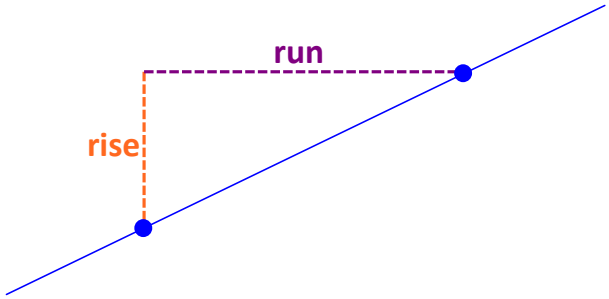
MTH1W Grade 9 Mathematics

4.2 Slope

Goal(s) ***- To investigate slope as a measure of the steepness of lines.***

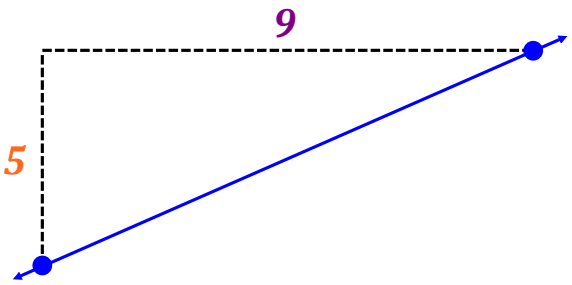
The **slope** (***m***) of a line is the ***steepness*** of the line. It is a comparison of the *vertical distance between points* (**rise**) and the *horizontal distance between points* (**run**).

$$\text{slope} = m = \frac{\text{rise}}{\text{run}}$$



The slope of a line can be expressed as a fraction in its lowest terms.

Label the **rise** and the **run.** Determine the **slope** of the line.

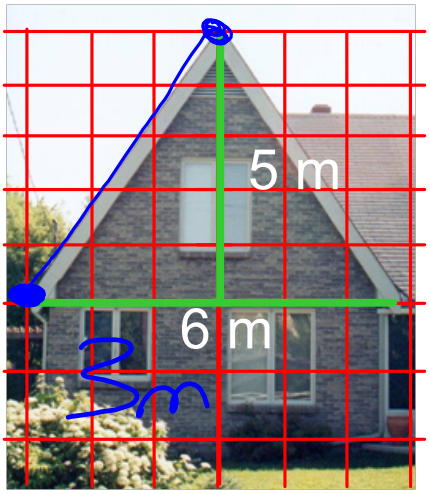


$$m = \frac{\text{rise}}{\text{run}}$$

$$m = \frac{5}{9}$$

The slope is $\frac{5}{9}$

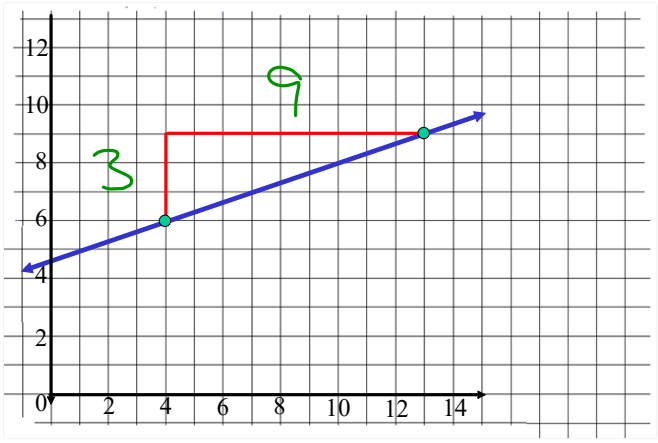
Label the rise and the run. Determine the slope (*pitch*) of the roof.



$$m = \frac{\text{rise}}{\text{run}}$$

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

Determine the slope. Describe the path/direction of the line.

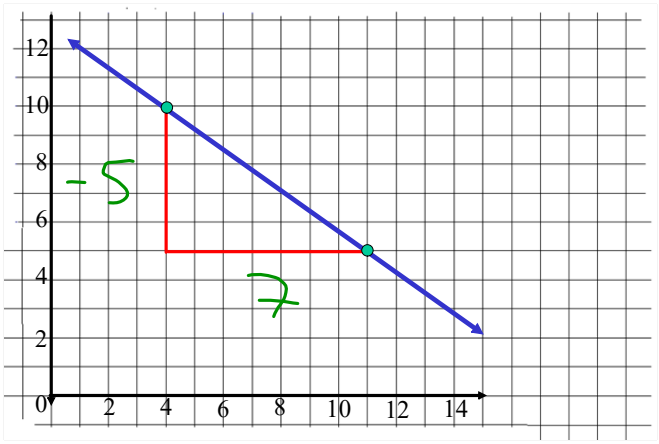


$$\text{Slope } m = \frac{\text{rise}}{\text{run}}$$

$$= \frac{3}{9}$$

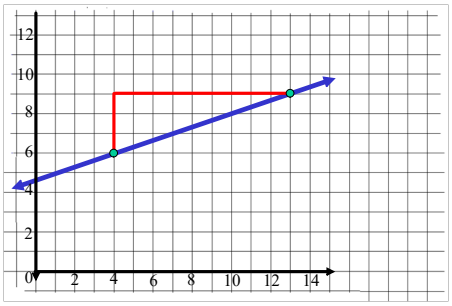
$$= \frac{1}{3}$$

Determine the slope. Describe the path/direction of the line.

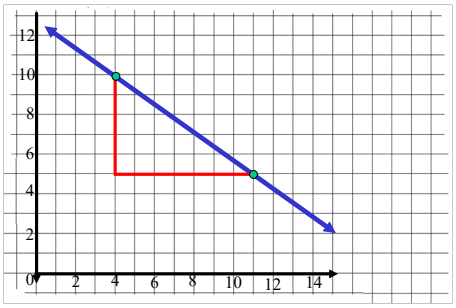


$$\text{slope } m = \frac{\text{rise}}{\text{run}} = \frac{-5}{7}$$

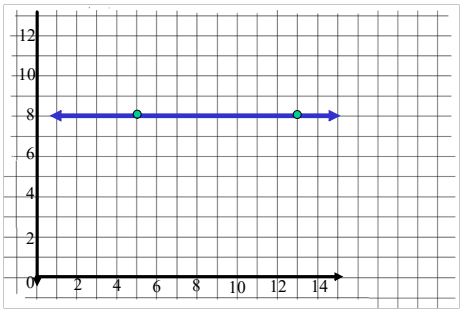
The graph of a line with a **positive slope rises to the right**.



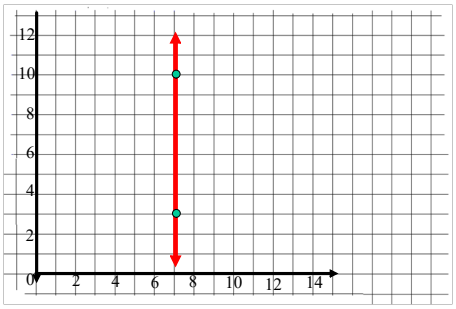
The graph of a line with a **negative slope falls to the right**.



A **horizontal** line has a **slope** of 0.
(There is no rise!)



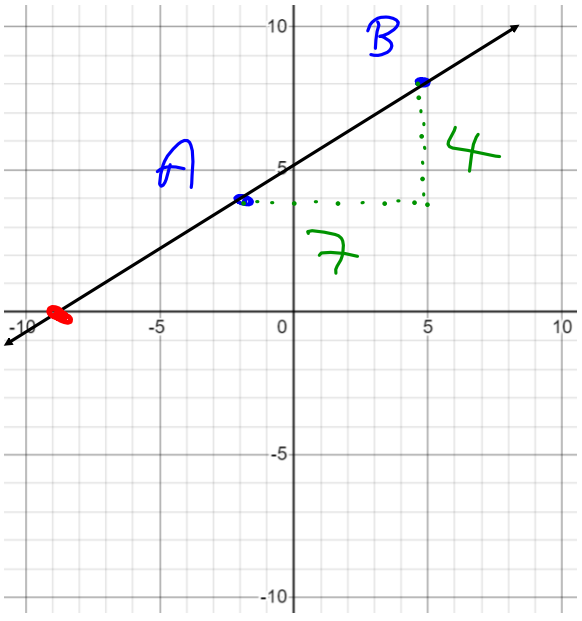
A **vertical** line has a **slope** that is **undefined**.
(There is no run!)



A line segment has one end point at $A(-2, 4)$ and the end point at $B(5, 8)$.

Determine the slope of the line segment.

State the coordinates of another point on the line.

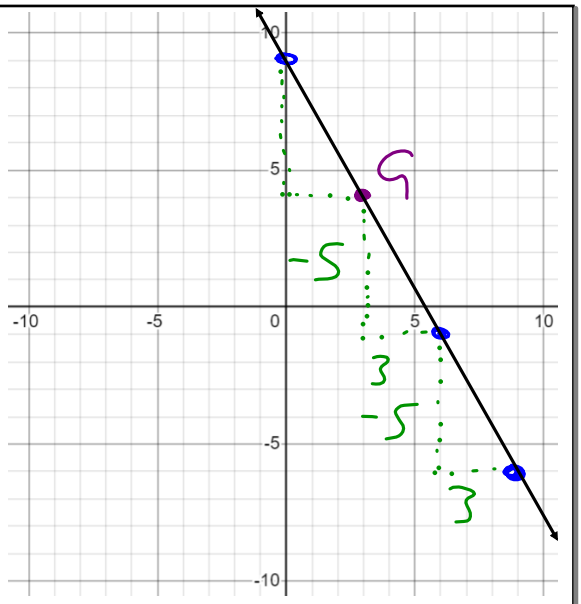


$$\text{slope } m = \frac{\text{rise}}{\text{run}}$$

$$= \frac{4}{7}$$

Another point is $(-9, 0)$ [there are others!]

A line segment has one endpoint at $G(3, 4)$, and a slope of $\frac{-5}{3}$. Find the coordinates of another possible endpoint.

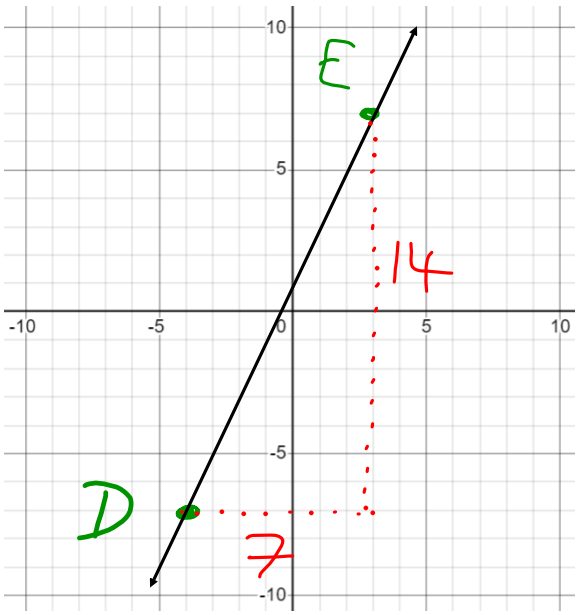


Other possible endpoints are

(6, -1) (9, -6)

(0, 9) amongst others

Determine the slope of the line that passes through the points $D(-4, -7)$ and $E(3, 7)$.



$$\text{Slope } m = \frac{\text{rise}}{\text{run}}$$

$$= \frac{14}{7}$$

$$= 2$$