Math122 College Algebra

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2.4
Lines

- The slope of a line is $slope = \frac{rise}{run}$
- For a line in the coordinate plane
  - run is the change in the x-coordinate
  - rise is the change in the y-coordinate

Slope of a Line

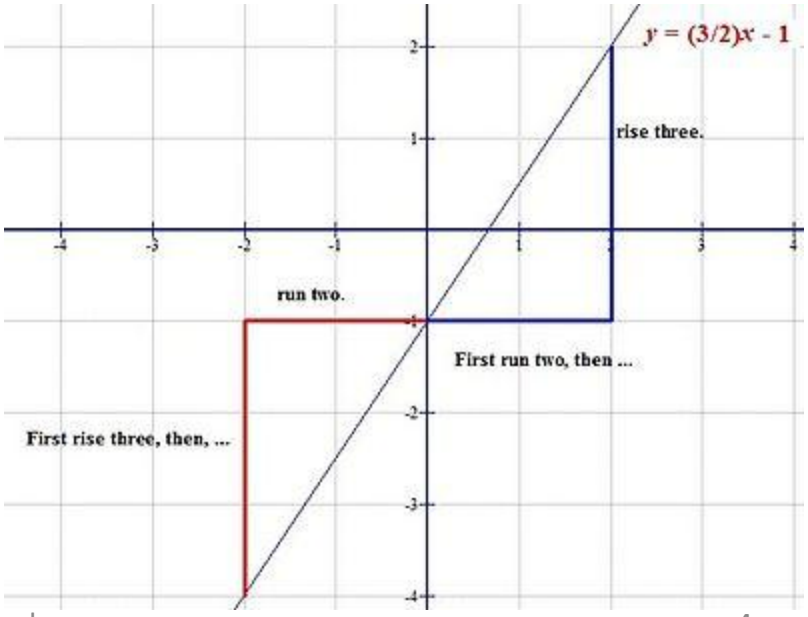
- The slope m of a nonvertical line that passes through points $A(x1, y1) and\ B(x2, y2) is$

$$m = \frac{rise}{run} = \frac{y2 - y1}{x2 - x1}$$

- The slope of a vertical line is undefined. Why?

Slope of a Line

- The slope is independent of which two points are chosen on the line
- Compute the slope using two different sets of points



http://en.wikipedia.org/wiki/Slope

Problem

1. Find the slope of the line that passes through the points P(2,2) and Q(4,5).

2. Using the slope find two more points that lie on the same line defined in 1.

Point-Slope Form

- An equation of the line passing through the point $P(x1, y1)$ with slope m is
$$y - y1 = m(x - x1)$$
- Find an equation of the line through $(1, -3)$ with slope $\frac{1}{2}$. Sketch the line

- Find an equation of the line through $(1, -3)$ with slope $-\frac{1}{2}$

Problem

1. Find an equation of the line passing through the two points $(1,1) and\ (3,4)$. Sketch the line.

2. Find an equation of the line passing through the two points $(-3,-2) and\ (3,-6)$. Sketch the line.

Slope-Intercept Form

- An equation of the line with slope m and $y - intercept$ is $y = mx + b$

- Find the equation of the line with slope 2 and y-intercept -1

- Find the slope and y-intercept of the line $2x + y = -5$