Entry #: _____

Lesson 1.10: Lines

The Slope of a Line

The slope *m* of a nonvertical line that passes through the points $A(x_1, y_1)$ and $B(x_2, y_2)$ is:

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

Practice: Find the slope of the line between the two points given.

1. $P(2,1)$ and $Q(23,25)$

2. $A(1,-3)$ and $B(-5,2)$

Point Slope Form of an Equation of a Line

An equation of the line that passes through the point (x_1, y_1) and has a slope m is:

$$y - y_1 = m(x - x_1)$$

Practice: Find the equation of the line in each of the problems below. Leave the equation in point slope form.

1. Through point $(1,-3)$ with slope $\frac{-3}{4}$.

2. Through points $(4,-3)$ & $(-4,3)$.

Slope Intercept Form of the Equation of a Line

An equation of the line that has slope m and has y-intercept b is:

$$y = mx + b$$

Practice: Find the equation of the line in each of the problems below. Leave the equation in slope-intercept form.

1. Find the equation of a line with slope -2 through the point $(1,3)$.

2. Find the equation of a line through points $(0,4)$ and $(-2,10)$

Vertical and Horizontal Lines

An equation of the vertical line through (a, b) is _____ .

An equation of the horizontal line through (a, b) is _____ .

Parallel and Perpendicular Lines

Two non-vertical lines are parallel if and only if they have the same _____ .

A slope that is perpendicular to another slope is its _____ (sign) _____ .

Practice:

1. Find the equation of a line perpendicular to $y = \frac{-1}{2}x + 3$ through the point $(1, -2)$.

2. Find the equation of a line parallel to $6x - 2 = 2y$ through the point $(0,5)$.