**Section 2.3—Linear Functions and Slope**

**Slope**: measures how steep a line is; ratio of vertical change to horizontal change; rise over run

**Example**: Find the slope of the line passing through each pair of points.

**Four Possibilities for the Slope of a Line**:

* positive slope: line rises from left to right
* negative slope: line that falls from left to right
* zero slope: horizontal line
* undefined slope: vertical line

**Point Slope Form of an Equation**:

* (x1, y1) is a point on the line
* m is the slope of the line

**Example**: Write the point-slope form of the equation of the line with slope 6 that passes through the point . Then solve for y.

**Example**: Write the point-slope form of the equation of the line passing through the points and . Then solve for y.

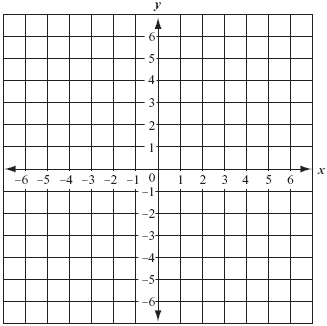
**Slope Intercept Form**:

* m represents the slope
* b represents the y-intercept

**Graphing y = mx + b using the slope and the y-intercept**.

1. Plot the y-intercept;
2. Get to the second point by using *m* to determine how much to “rise” and how much to “run;” STARTING AT THE Y-INTERCEPT.
3. Draw a line through the two points.

**Example**: Graph the linear function



**Equation of a Horizontal Line**:

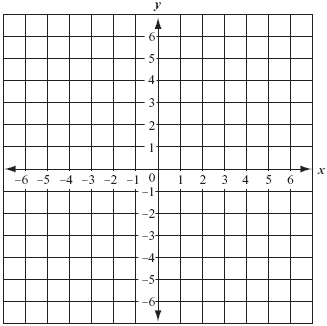
* Horizontal lines have a slope of zero.

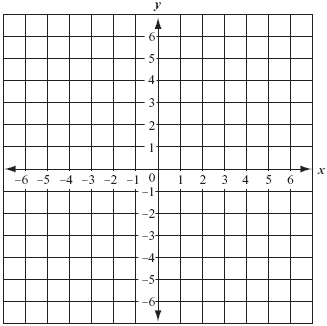
**Equation of a Vertical Line**:

* Vertical lines have a slope that is undefined.

**Example**: Graph the following.

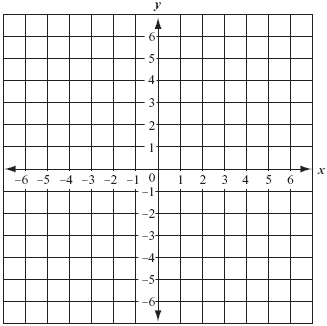






**General Form of an Equation**: , both A and B cannot be 0

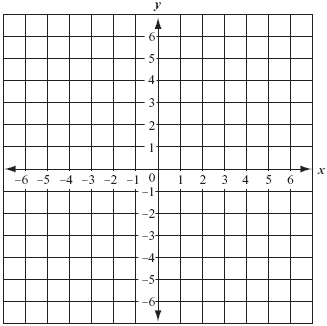
**Example**: Find the slope and y-intercept of the line whose equation is . Then use those to graph the line.



**Using Intercepts to Graph Ax + By + C = 0**

1. Find the x-intercept. Let and solve for x. Plot that point.
2. Find the y-intercept. Let and solve for y. Plot that point.
3. Draw a line through the two points.

**Example**: Graph using intercepts.



**Summary of Equations of Lines**

|  |  |
| --- | --- |
| Point-Slope Form |  |
| Slope-Intercept Form |  |
| Horizontal Line | y = b |
| Vertical Line | x = a |
| General | Ax + By + C = 0 |