Section 3.7 Coordinate Geometry - Equations of Lines

# Objective 1: Use the Slope-Intercept Form

Recall that the form is called the slope-intercept form of a linear equation because is the slope of the line and the point is the -intercept of the line.

The slope-intercept form can be used to write the equation of a line when its slope and -intercept are known.

a. Find the equation of the line with slope and -intercept of .

We can also use the slope-intercept form of the equation of a line to graph a linear equation.

b. Use the slope-intercept form to graph the equation .



# Objective 2: Use the Point-Slope Form

Given the slope and any point on a line, we can write its equation using the point-slope form of the equation of a line. This form can be derived from the slope formula. Suppose we are given the slope of a line and a point on the line, and is any other point on the line.

This is the **point-slope form** of the equation of a line.

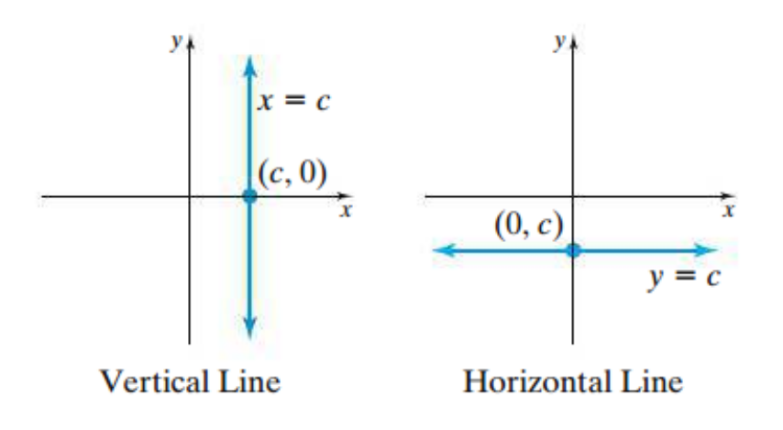
a. Find the equation of the line that has a slope of and passes through the point . Give the equation in standard form.

When given two points on a line, we can find the equation by first finding the slope and then writing the equation in point-slope form.

b. Find the equation of the line that passes through the points and . Give the equation in standard form.

# Objective 3: Writing Equations of Vertical and Horizontal Lines

Recall that vertical lines have equations of the form and horizontal lines have equations of the form .



a. Find the equation of the vertical line that passes through the point

b. Find the equation of the horizontal line that passes through the point

# Objective 4: Find the Equations of Parallel and Perpendicular Lines

a. Find the equation of the line, in slope-intercept form, that passes through the point and is parallel to the line .

b. Find the equation of the line, in slope-intercept form, that passes through the point and is perpendicular to the line .

c. Find an equation of the line, in standard form, that passes through the point  and is parallel to the line .

d. Find the equation, in standard form, of the perpendicular bisector of the line segment with endpoints  and.