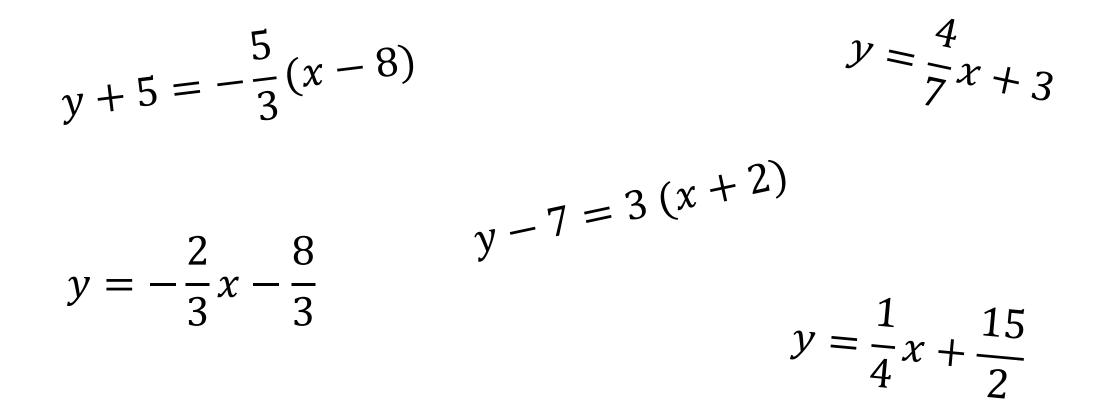# Finding Linear Functions

Bell Work:

1. **Solve and show all work.** $\frac{2}{3}(a + 5) = \frac{4}{5}a - 3$

2. **What is the slope of a line that is perpendicular to** $y = -\frac{3}{4}x + 4$?

3. **What is the slope of a line that is parallel to** $y = \frac{5}{3}x - 2$?

4. **What is the slope of the linear function** $2x - 3y = -12$**?**

Today, you are going to write linear functions.

$$y + 5 = -\frac{5}{3}(x - 8)$$

$$y = \frac{4}{7}x + 3$$

$$y - 7 = 3(x + 2)$$

$$y = -\frac{2}{3}x - \frac{8}{3}$$

$$y = \frac{1}{4}x + \frac{15}{2}$$

Finding Linear Functions

1. What is the **point-slope form** of the linear function that is parallel to $y = \frac{3}{2}x + 4$ and goes through (-3, 7)?

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

Use the point-slope formula and substitute the numbers into it.

$$y - 7 = \frac{3}{2}(x - -3)$$

$$y - 7 = \frac{3}{2}(x + 3)$$

Finding Linear Functions

2. **What is the point-slope form** of the linear function that is **perpendicular to** $y = -\frac{2}{5}x - 9$ **and goes through (6, -2)?**

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

Use the point-slope formula and substitute the numbers into it.

$$y - -2 = \frac{5}{2}(x - 6)$$

Flip and switch the slope.

$$y + 2 = \frac{5}{2}(x - 6)$$

3. What is the **slope-intercept form** of the linear function that is perpendicular to $y + 6 = 3(x - 9)$ and goes through (-9, 4)?

Use the point-slope formula and substitute the numbers into it.

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

$$y - 4 = -\frac{1}{3}x - 3$$

Flip and switch the slope.

$$y - 4 = -\frac{1}{3}(x - -9)$$

$$y = -\frac{1}{3}x + 1$$

Change to slope-intercept form.

$$y - 4 = -\frac{1}{3}(x + 9)$$

Finding Linear Functions

4. What is the **slope-intercept form** of the linear function that is parallel to $4x - 3y = -16$ and goes through (6, -7)?

$$m = -\frac{A}{B} = -\frac{4}{-3} = \frac{4}{3}$$

Use the point-slope formula and substitute the numbers into it.

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

$$y + 7 = \frac{4}{3}x - 8$$

Change to slope-intercept form.

$$y - -7 = \frac{4}{3}(x - 6)$$

$$y = \frac{4}{3}x - 15$$

Finding Linear Functions

5. What is the **slope-intercept form** of the linear function that is parallel to $y - 5 = -\frac{3}{4}(x + 2)$ and goes through (-3, -5)?

Use the point-slope formula and substitute the numbers into it.

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

$$y - -5 = -\frac{3}{4}(x - -3)$$

Change to slope-intercept form.

$$y + 5 = -\frac{3}{4}(x + 3)$$

$$y + 5 = -\frac{3}{4}x - \frac{9}{4}$$

$$y = -\frac{3}{4}x - \frac{29}{4}$$

6. What is the **slope-intercept form** of the linear function that is perpendicular to $y = \dfrac{2}{5}x - 7$ and goes through (9, 2)?

Use the point-slope formula and substitute the numbers into it.

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

$$y = -\frac{5}{2}x + \frac{49}{2}$$

Flip and switch the slope.

$$y - 2 = -\frac{5}{2}(x - 9)$$

Change to slope-intercept form.

$$y - 2 = -\frac{5}{2}x + \frac{45}{2}$$

Finding Linear Functions

Parallel lines have the same slope.

Perpendicular lines have the opposite reciprocal slope.

Flip and Switch

Finding Linear Functions

Assignment:

Finding Parallel and Perpendicular Linear Functions Worksheet