Bell Ringer

Write the equation of the line that passes through the given point and has the given slope.

slope = 1/3
point (-6 , 0)

$0 = \frac{1}{3}(-6) + b$

$0 = -2 + b$

$+2 \quad +2$

$2 = b$

$y = \frac{1}{3}x + 2$

Writing Linear Equations Given Two Points

Steps:

1) Use the points to calculate the slope. $m = \frac{y_1 - y_2}{x_1 - x_2}$

2) Use one of the points and the slope to find the y-intercept.

3) Write the equation in slope-intercept form; $y = mx + b$

New Concept

Perpendicular lines are lines that intersect at right angles.

Perpendicular lines have opposite, reciprocal slopes.

1. Write the equation of the line that passes through (-3, 1) and (5 , 5).

$$m = \frac{1-5}{-3-5} = \frac{-4}{-8} = \frac{1}{2}$$

$$y = \frac{1}{2}x + b$$

$$5 = \frac{1}{2}(5) + b$$

$$5 = \frac{5}{2} + b$$

$$5 - \frac{5}{2} = b$$

$$\frac{5}{2} = b$$

$$y = \frac{1}{2}x + \frac{5}{2}$$

2. Write the equation of the line that passes through (2, -3) and (-3 , 7).

$$m = \frac{-3-7}{2--3} = \frac{-10}{5} = -2$$

$$y = -2x + b$$

$$-3 = -2(2) + b$$

$$-3 = -4 + b$$

$$1 = b$$

$$y = -2x + 1$$

Explain if these lines are perpendicular without graphing.

3. $y = 4x + 1$ and $y = -4x - 6$

No, because the slopes are not opposite reciprocal.

4. $y = 1/3x + 6$ and $y = -3x + 2$

Yes, 1/3 and -3 are opposite reciprocal slopes.

5. A camp program charges a one-time registration fee and a per day activity charge. The total bill for one camper was $338 for 12 days, and the total bill for another camper was $506 for 19 days. Write an equation that models the total cost for any number of days. Then use the model to find the cost for 30 days.

Let x = the number of days

Let y = total cost

(12, 338)

(19, 506)

$m = \frac{506-338}{19-12} = \frac{168}{7} = 24$

$y = mx + b$

$338 = 24(12) + b$

$338 = 288 + b$

$50 = b$

$y = 24x + 50$

$y = 24(30) + 50$

$y = \$770$ for 30 days