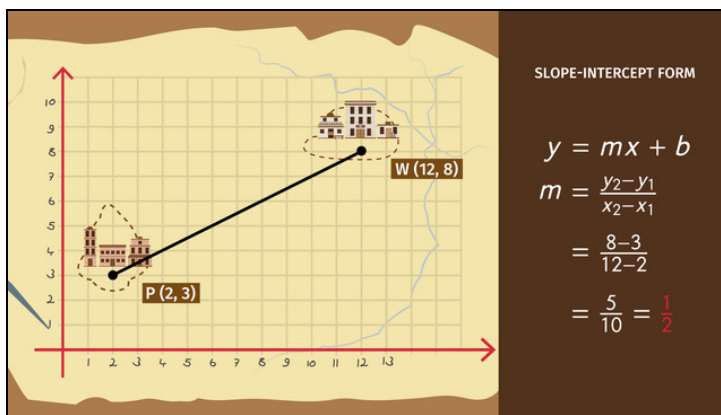Printable Worksheets from sofatutor.com

Writing Linear Equations

1. **Determine the linear equation in slope-intercept form.**

2. Explain how to set up an equation for a parallel line.

3. Find the equation of the line that is perpendicular to $y = \frac{1}{2}x + 2$ and passes through $B(7, 5)$.

4. Decide which equations are represented by the given graphs.

5. Write the equations for the given graphs in different forms.

+. with lots of tips, answer keys, and detailed answer explanations for all of the problems.

⚠ The complete package, **including all problems, hints, answers, and detailed answer explanations** is available for all sofatutor.com subscribers.

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Worksheet: Writing Linear Equations
Mathematics / Algebra 1 / Linear Equations and Inequalities / Writing Linear Equations

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Determine the linear equation in slope-intercept form.

Fill in the blanks.

W.J. Palmer is planning a new rail road track to run between two cities, Palm Valley and Wildwood Crest.

The rail road track will be a straight line which is the shortest route possible.

Palm Valley is located at the point $P(2,3)$, and Wildwood Crest at $W(12,8)$.

$$\boxed{2} \quad \boxed{1} \quad \boxed{x_1 - x_2} \quad \boxed{2} \quad \boxed{2} \quad \boxed{y_2 - y_1} \quad \boxed{8 - 3} \quad \boxed{2} \quad \boxed{1} \quad \boxed{3} \quad \boxed{8 - 2}$$

$$\boxed{x_2 - x_1} \quad \boxed{12 - 2} \quad \boxed{12 - 3} \quad \boxed{2}$$

1 First, we need to determine the slope of the equation by using the slope formula:

$$m = \underline{\hspace{3cm}}_1 \div \underline{\hspace{3cm}}_2$$

- y_1 and y_2 are the y-coordinates.

- x_1 and x_2 are the x-coordinates.

Plugging in the coordinates of $P(2,3)$ and $W(12,8)$, we get:

$$m = \underline{\hspace{3cm}}_3 \div \underline{\hspace{3cm}}_4$$

Simplified and reduced as much as possible, we get:

$$m = \underline{\hspace{3cm}}_5 \div \underline{\hspace{3cm}}_6$$

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2 Using the slope, we can find the y-intercept.

We can use one of the given points, for example $P(2, 3)$, and plug the given values for x and y into the equation:

$$\underline{\hspace{3cm}}_7 = m \times \underline{\hspace{3cm}}_8 + b$$

Substituting $\frac{1}{2}$ for m, we get:

$$b = \underline{\hspace{3cm}}_9$$

3 Finally, we can write the equation in slope-intercept form:

$$y = \underline{\hspace{3cm}}_{10} \div \underline{\hspace{3cm}}_{11} x + \underline{\hspace{3cm}}_{12}$$

Hints for solving these problems

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Determine the linear equation in slope-intercept form.

Hint #1

The slope-intercept form is: $y = mx + b$.

- m is the slope
- b is the y-intercept

Hint #2

To calculate the y-intercept, you have to plug in one of the given points.

Hint #3

When calculating the slope, make sure to be consistent when ordering the points.

Answers and detailed answer explanations for these problems

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Determine the linear equation in slope-intercept form.

Answer key: 1: $y_2 - y_1$ // 2: $x_2 - x_1$ // 3: $8 - 3$ // 4: $12 - 2$ // 5: 1 // 6: 2 // 7: 3 // 8: 2 // 9: 2 // 10: 1 // 11: 2 // 12: 2

A linear equation written in slope-intercept form is: $y = mx + b$.

m represents the slope, and b represents the y-intercept.

In order to identify the linear equation, we start with the slope, which is given as the change in y divided by the change in x:

- $m = \frac{y_2 - y_1}{x_2 - x_1}$

Let's plug in the given coordinates of the two points:

- $m = \frac{8-3}{12-2} = \frac{5}{10} = \frac{5 \div 5}{10 \div 5} = \frac{1}{2}$

The equation is:

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

The y-intercept b is still unknown. To figure out the y-intercept, we plug the coordinates of either P or W into the equation. Here we use P. You can also use W, you'll get the same y-intercept value.

$$3 = \frac{1}{2} \times 2 + b$$
$$= 1 + b$$

Subtracting 1 leads to $b = 2$.

As a result we get the linear equation in slope-intercept form:

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

You can check this equation by substituting the coordinates of the other point into the equation:

- $8 = \frac{1}{2} \times 12 + 2 = 6 + 2 \ \checkmark$