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Point slope word problems worksheet

Are you looking for an easy method to write linear equations when given slope and a point? Point-Slope Form is the answer! You've found the right page! Yes, Algebra teachers do try to make it easier for you to write these equations. There is yet another form that can be used to write linear equations in slope intercept form. This form is particularly useful when writing equations give slope and a point, but can also easily be used to write equations given two points. So, What is Point-Slope Form? Point-slope form is $y - y_1 = m(x - x_1)$, where $(x_1$ and $y_1)$ are the coordinates of a point on the line, and m is the slope of the line. Take a look.... How Do You Use Point-Slope Form? So, this form looks a little complicated, how is it used? It's really pretty easy. It just takes a little substitution and rewriting the equation in slope intercept form. Let's take a look at an easy problem given slope and a point. Write the equation for a line that has a slope of 3 and passes through the point (2,1). Solution That wasn't too bad, was it? I think this is a pretty easy form to use once you use it a few times. We will have to add one additional step to this process if we are given a problem with two points. You will always need to know the slope in order to use this equation. But, that's not a problem when you know the formula for finding slope given two points. So, take a look with me.... Example 2: Writing Equations Using Point-Slope Form Write an equation for a line that passes through the following points: (-4,4) and (6,9) Solution As you can see, point-slope form is pretty easy to use once you learn how to substitute for the slope and one point. Just remember: You must know (or be able to find) the slope and you must also know one point that lies on the line. If you are still having difficulty, take a look at the following video, which will walk you step by step through example 2 above. Home > Writing Equations > Point-Slope Form This exclusive ensemble of printable worksheets has been designed to help 8th grade and high school learners comprehend the basics of converting equation of a line to point-slope form and writing equation of a line using the given point and the slope. A series of exercises requires students to find the equations of a line that is either parallel or perpendicular to another equation of the line. The pdf worksheets based on graphing the line using a point and the slope are also included. Access some of these worksheets for free! Printing Help - Please do not print worksheets with grids directly from the browser. Kindly download them and print. Equation of a Line: Point-Slope Form Write the equation of a line in point-slope form based on the slope and the point provided in this set of printable worksheets. There are ten problems in each worksheet. Equation of a Line: Slope-Intercept Form - Level 1 Based on the point and the slope provided for each question, apply point-slope formula to find the equation of a line and express the equation in slope-intercept form: $y = mx + b$. This level of worksheets features coordinates in the form of integers, and the slope provided can either be an integer or a fraction. Equation of a Line: Slope-Intercept Form - Level 2 In the second level of worksheets, the coordinates are represented as fractions and the slopes are either in the form of integers or simplified fractions. Find the equation of a line and write the equation in slope-intercept form. Equation of a Line: Standard Form - Level 1 Find the equation of a line based on the given slope and a point and express the equation in standard form. The slopes in this collection of grade 8 and high school pdf worksheets can be in the form of either integers or fractions whereas the coordinates are represented in integer form. Equation of a Line: Standard Form - Level 2 In this second level of worksheets, the coordinates are given as fractions and the slopes can be either in the form of fractions or integers. Apply point-slope formula and find the equation of a line. Represent the equation of a line in standard form $ax + by = c$. Parallel and Perpendicular Lines Find the equation of a line that is passing through the given point and is either parallel or perpendicular to another line. Write the equation of a line in standard form. Download these worksheets for ample practice. Graph the Line: Point-Slope Form Use this exclusive set of printable worksheets to graph the line based on the point and the slope provided. Plot the given point, mark another point on the grid using the given slope and graph the line. Use the answer key to verify your responses. If you know the slope and any point on the line, you can write an equation of the line by using the slope formula. For example, suppose a line has a slope of 2 and contains (3, 5). Let (x, y) be any other point on the line. Slope Formula : $m = (y_2 - y_1) / (x_2 - x_1)$ Substitute $m = 2$, $(x_1, y_1) = (3, 5)$ and $(x_2, y_2) = (x, y)$. $2 = (y - 5) / (x - 3)$ Multiply each side by $(x - 3)$. $2(x - 3) = y - 5$ or $y - 5 = 2(x - 3)$ Point-Slope Form of a Linear Equation The line with slope 'm' that contains the point (x_1, y_1) can be described by the equation $y - y_1 = m(x - x_1)$ Writing Linear Equations in Point-Slope Form Write an equation in point-slope form for the line with the given slope that contains the given point. Example 1 : Slope = 5 ; (2, 0). Solution : Write the point-slope form. $y - y_1 = m(x - x_1)$ Substitute 5 for m, 2 for x_1 and 0 for y_1 . $y - 0 = 5(x - 2)$ Example 2 : Slope = -7 ; (-2, 3). Solution : Write the point-slope form. $y - y_1 = m(x - x_1)$ Substitute -7 for m, -2 for x_1 and 3 for y_1 . $y - 3 = -7(x - (-2))$ $y - 3 = -7(x + 2)$ Using Point-Slope Form to Graph A line can be graphed when given its equation in point-slope form. You can start by using the equation to identify a point on the line. Then use the slope of the line to identify a second point. Graph the line described by each equation. Example 3 : $y - 1 = 3(x - 1)$ Solution : $y - 1 = 3(x - 1)$ is in the form $y - y_1 = m(x - x_1)$. Slope $m = 3 = 3/1$ The line contains the point $(1, 1)$. Step 1 : Plot $(1, 1)$. Step 2 : Count 3 units up and 1 unit right and plot another point. Step 3 : Draw the line connecting the two points. Example 4 : $y + 2 = (-1/2)(x - 3)$ Solution : Step 1 : Write the equation in point-slope form. $y - y_1 = m(x - x_1)$ $y + 2 = (-1/2)(x - 3)$ Rewrite addition of 2 as subtraction of -2. $y - (-2) = (-1/2)(x - 3)$ Step 2 : The line contains the point $(3, -2)$. Slope $m = -1/2 = 1/(-2)$ Plot $(3, -2)$. Count 1 unit up and 2 units left and plot another point. Draw the line connecting the two points. Writing Linear Equations in Slope-Intercept Form Write the equation that describes each line in slope-intercept form. Example 5 : slope = -4, (-1, -2) is on the line. Solution : Because the slope of the line and a point on the line are given, we can write the equation of the line in point-slope form. $y - y_1 = m(x - x_1)$ Substitute $m = -4$ and $(x_1, y_1) = (-1, -2)$. $y - (-2) = -4(x - (-1))$ Simplify and solve for y . $y + 2 = -4(x + 1)$ Distribute -4 on the right side. $y + 2 = -4x - 4$ Subtract 2 from each side. $y + 2 = -4x - 4$ $y = -4x - 6$ Example 6 : $(1, -4)$ and $(3, 2)$ are on the line. Solution : Find the slope. $m = (y_2 - y_1) / (x_2 - x_1) = [2 - (-4)] / (3 - 1) = (2 + 4) / 2 = 6/2 = 3$ Substitute the slope and one of the points into the point-slope form. Then write the equation in slope-intercept form. $y - y_1 = m(x - x_1)$ Substitute $m = 3$, $(x_1, y_1) = (3, 2)$. $y - 2 = 3(x - 3)$ Simplify. $y - 2 = 3x - 9$ Add 2 to each side. $y = 3x - 7$ Example 7 : x-intercept = -2, y-intercept = 4. Solution : Use the intercepts to find two points : (-2, 0) and (0, 4) Find the slope. $m = (y_2 - y_1) / (x_2 - x_1) = (4 - 0) / [(0 - (-2))] = 4/2 = 2$ Write the equation in slope-intercept form. $y = mx + b$ Substitute 2 for m and 4 for b. $y = 2x + 4$ Using Two Points to Find Intercepts Example 8 : The points (4, 8) and (-1, -12) are on a line. Find the intercepts. Solution : Step 1 : Find the slope. $m = (y_2 - y_1) / (x_2 - x_1) = (-12 - 8) / (-1 - 4) = -20 / (-5) = 4$ Step 2 : Write the equation in point-slope form. $y - y_1 = m(x - x_1)$ Substitute $m = 4$, $(x_1, y_1) = (4, 8)$. $y - 8 = 4(x - 4)$ Simplify and solve for y . $y - 8 = 4x - 16$ Add 8 to each side. $y = 4x - 8$ Step 3 : Find the intercepts : x - intercept : 0 = $4x - 8$ = $4x = 8$ = $x = 2$ y - intercept : $y = 4(0) - 8y = -8$ The x-intercept is 2, and the y-intercept is -8. Problem-Solving Application Example 9 : The cost to place an ad in a newspaper for one week is a linear function of the number of lines in the ad. The costs for 3, 5, and 10 lines are shown. Write an equation in slope-intercept form that represents the function. Then find the cost of an ad that is 18 lines long. Solution : Understand the Problem : • The answer will have two parts—an equation in slope-intercept form and the cost of an ad that is 18 lines long. • The ordered pairs given in the table satisfy the equation. Make a Plan : First, find the slope. Then use point-slope form to write the equation. Finally, write the equation in slope-intercept form. Solve : First, find the slope. Then use point-slope form to write the equation. Finally, write the equation in slope-intercept form. Step 1 : Choose any two ordered pairs from the table to find the slope. $m = (y_2 - y_1) / (x_2 - x_1)$ Use (3, 13.50) and (5, 18.50). $m = (18.50 - 13.50) / (5 - 3) = 5/2 = 2.5$ Step 2 : Substitute the slope and any ordered pair from the table into the point-slope form. $y - y_1 = m(x - x_1)$ Substitute $m = 2.5$, $(x_1, y_1) = (10, 31)$. $y - 31 = 2.5(x - 10)$ Step 3 : Write the equation in slope-intercept form by solving for y . $y - 31 = 2.5(x - 10)$ Distribute 2.5. $y - 31 = 2.5x - 25$ Add 31 to each side. $y = 2.5x + 6$ Step 4 : Find the cost of an ad containing 18 lines by substituting 18 for x . $y = 2.5x + 6y = 2.5(18) + 6y = 45 + 6y = 51$ The cost of an ad containing 18 lines is \$51. Apart from the stuff given above, if you need any other stuff in math, please use our google custom search here. If you have any feedback about our math content, please mail us : v4formath@gmail.com We always appreciate your feedback. 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