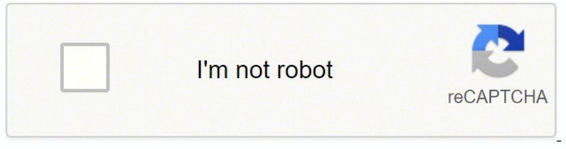

Next

Change the given equation to slope intercept form y-3x 2

Any equation that relates the first power of x to the first power of y produces a straight line on an x-y graph. The standard form of such an equation is Ax + By + C = 0 or Ax + By = C. When you rearrange this equation to get y by itself on the left side, it takes the form y = mx +b. This is called slope intercept form because m is equal to the slope of the line, and b is the value of y when x = 0, which makes it the y-intercept. Converting from slope intercept form to standard form takes little more than basic arithmetic. To convert from slope intercept form y = mx + b to standard form Ax + By + C = 0, let m = A/B, collect all terms on the left side of the equation and multiply by the denominator B to get rid of the fraction. An equation in slope intercept form has the basic structure y = mx + b \begin{aligned} y - mx &= (mx - mx) + b \\ y - mx &= b \end{aligned} \begin{aligned} y - mx - b &= b - b \\ y - mx - b &= 0 \end{aligned} -mx + y - b = 0 If m is an integer, then B will equal 1. -\frac{A}{B}x + y - b = 0 -Ax + By - Bb = 0 -Ax + By - C = 0 (1) - The equation of a line in slope intercept form is: y = \frac{1}{2} x + 5 What is the equation in standard form? y - \frac{1}{2}x = 5 y - \frac{1}{2}x - 5 = 0 2y - x - 10 = 0 -x + 2y - 10 = 0 You can leave the equation like this, but if you prefer to make x positive, multiply both sides by -1: x - 2y + 10 = 0 x - 2y = -10 (2) - The slope of a line is -3/7 and the y-intercept is 10. What is the equation of the line in standard form? The slope intercept form of the line is y = -\frac{3}{7}x + 10 Following the procedure outlined above: \begin{aligned} y + \frac{3}{7}x - 10 = 0 \\ 7y + 3x - 70 = 0 \\ 3x + 7y -70 = 0 \\ \text{or} \\ 3x + 7y = 70 \end{aligned} Earlier in this chapter we have expressed linear equations using the standard form Ax + By = C. Now we're going to show another way of expressing linear equations by using the slope-intercept form y = mx + b. In the slope-intercept form you use the slope of the line and the y-intercept to express the linear function. $$y=mx+b$$ Where m is the slope and b is the y-intercept. Example Graph the equation $$y-2x=1$$ rewrite in slope-intercept form $$y=2x+1$$ Identify the slope and the y-intercept m = 2 and b = 1 Plot the point corresponding to the y-intercept, (0,1) The m-value, the slope, tells us that for each step to the right on the x-axis we move 2 steps upwards on the y-axis (since m = 2) And once you have your second point you can just draw a line through the two points and extend it in both directions. You can check to see that the line you've drawn is the correct one by substituting the coordinates of the second point into the original equation. If the equation holds true than the second point is correct. Our second point = (1, 3) $$y-2x=1$$ $$3-2\cdot 1=3-2=1$$ Our second point is a solution to the equation i.e. the line we drew is correct. A line that passes through the origin has a y-intersect of zero, b = 0, and represents a direct variation. $$y=mx$$ In a direct variation the nonzero number m is called the constant of variation. You can name a function, f by using the function notion $$f\left (x \right)=mx+b$$ f(x) is another name for y and is read as "the value of f at x" or "f of x". You can use other letters than f to name functions. A group of functions that have similar characteristics are called a family of functions. All functions that can be written on the form f(x) = mx + b belong to the family of linear functions. The most basic function in a family of functions is called the parent function. The parent function of all linear functions is $$f\left (x \right)=x$$ Video lesson Graph y = 3x - 2 While there are infinitely-many different literal equations, some kinds are more likely to be important, and sooner, than other. Probably one of the most important classes of literal equations we often need to solve will be linear equations. For whatever reason, there are different formats for simple linear equations. I prefer the slope-intercept form; at times, the point-slope form is helpful; some textbooks strongly prefer what they sometimes call the "intercept" form, which is often (though not always) given as being "Ax + By = C", so-called because the intercepts are at and . (Still others prefer a "standard" form, for which there is no actual standard. But I digress.) Converting to Slope-Intercept Form Whatever the original form of a linear equation, it is often helpful, especially for graphing, to have the equation rearranged into "y=" form. Solving a linear equation in two variables for y= is a type of literal-equation solving. Here's how it works: In order to find the slope, it is simplest to put this line equation into slope-intercept form. If I rearrange this line to be in the form "y = mx + b", it will be easy to read off the slope m. So I'll solve: I know that the slope of the line is whatever number is multiplied on the x, so my answer is: I didn't have to solve the equation above for y=. I could have picked two x-values, plugged them into the equation, solved for the corresponding y-values, plugged the two resulting points into the slope formula, and simplified to find the value of m. But, all things considered, solving for y= and simply reading the value of m from the equation was a whole lot easier and faster. I know that, if I can solve the equation for y=, I'll be able to read the values of the slope m and the y-intercept b right off of the equation. So I'll solve for "y=": 2x − y = 5 2x = y + 5 2x − 5 = y Now that I have the equation rearranged into slope-intercept form, I can read the values I need right from the equation: slope m = 2 y-intercept b = −5 I could go to the trouble of finding two points and computing the slope, or of plugging zero in for x and solving for the y-intercept value, but it's simpler to just solve for "y=". x − 2y = 5 x = 2y + 5 x − 5 = 2y If I prefer, I can flip the sides of the equation, so I get: This isn't required, but can make things look nicer. Either way, I can now read the required values from the equation: I'll solve for "y=": 4x + 5y = 12 5y = − 4x + 12 The values here are messy, but that's okay. In fact, by simply solving the equation for y, I probably helped myself avoid making errors with the fractions. In any case, my answers are: Sometimes, there is no particular context; they just want you to solve the equation for y. Well, that's certainly… needlessly complicated. Whatever; the solution method remains the same: 4y − 5x −18 = 13x − 2y + 6 4y + 2y − 5x − 18 = 13x + 6 6y − 18 = 13x + 5x + 6 6y = 18x + 6 + 18 6y = 18x + 24 y = 3x + 4 All that, to end up with such a simple equation as my answer! From what I've learned about slope, I know that parallel lines have the same slope, and perpendicular lines have slopes which are negative reciprocals (that is, which have opposite signs and which are flipped fractions of each other). So I can solve the literal equations for y= and compare the slopes to answer this question. Upon closer examination, I notice that one of the equations they gave me is actually already solved for y; I'll flip the sides of the equation to put it in the "normal" order: Now I'll solve the other equation for y: The slopes are and . These slopes have opposite signs, so their lines are not parallel. But the slopes are the same fraction, rather than one being the flip (that is, the reciprocal) of the other, so these lines are not perpendicular, either. So my answer is: neither parallel nor perpendicular There are many contexts, such as graphing and solving systems of equations, in which you will want to be able to solve a linear equation for "y=". Make sure that you are comfortable with these techniques. URL: If you're seeing this message, it means we're having trouble loading external resources on our website. If you're behind a web filter, please make sure that the domains *.kastatic.org and *.kasandbox.org are unblocked. Recognize the Relation Between the Graph and the Slope–Intercept Form of an Equation of a Line In the following exercises, use the graph to find the slope and y-intercept of each line. Compare the values to the equation . slope and y-intercept slope and y-intercept Identify the Slope and y-Intercept From an Equation of a Line In the following exercises, identify the slope and y-intercept of each line. Graph a Line Using Its Slope and Intercept In the following exercises, graph the line of each equation using its slope and y-intercept. Choose the Most Convenient Method to Graph a Line In the following exercises, determine the most convenient method to graph each line. Graph and Interpret Applications of Slope–Intercept The equation models the relation between the amount of Tuyet's monthly water bill payment, P, in dollars, and the number of units of water, w, used. Find Tuyet's payment for a month when 0 units of water are used. Find Tuyet's payment for a month when 12 units of water are used. Interpret the slope and P-intercept of the equation. Graph the equation. The equation models the relation between the amount of Randy's monthly water bill payment, P, in dollars, and the number of units of water, w, used. Find the payment for a month when Randy used 0 units of water. Find the payment for a month when Randy used 15 units of water. Interpret the slope and P-intercept of the equation. Graph the equation. ?28 ?66.10 The slope, 2.54, means that Randy's payment, P, increases by ?2.54 when the number of units of water he used, w, increases by 1. The P–intercept means that if the number units of water Randy used was 0, the payment would be ?28. Bruce drives his car for his job. The equation models the relation between the amount in dollars, R, that he is reimbursed and the number of miles, m, he drives in one day. Find the amount Bruce is reimbursed on a day when he drives 0 miles. Find the amount Bruce is reimbursed on a day when he drives 220 miles. Interpret the slope and R-intercept of the equation. Graph the equation. Janelle is planning to rent a car while on vacation. The equation models the relation between the cost in dollars, C, per day and the number of miles, m, she drives in one day. Find the cost if Janelle drives the car 0 miles one day. Find the cost on a day when Janelle drives the car 400 miles. Interpret the slope and C–intercept of the equation. Graph the equation. ?15 ?143 The slope, 0.32, means that the cost, C, increases by ?0.32 when the number of miles driven, m, increases by 1. The C-intercept means that if Janelle drives 0 miles one day, the cost would be ?15. Cherie works in retail and her weekly salary includes commission for the amount she sells. The equation models the relation between her weekly salary, S, in dollars and the amount of her sales, c, in dollars. Find Cherie's salary for a week when her sales were 0. Find Cherie's salary for a week when her sales were 3600. Interpret the slope and S–intercept of the equation. Graph the equation. Patel's weekly salary includes a base pay plus commission on his sales. The equation models the relation between his weekly salary, S, in dollars and the amount of his sales, c, in dollars. Find Patel's salary for a week when his sales were 0. Find Patel's salary for a week when his sales were 18,540. Interpret the slope and S-intercept of the equation. Graph the equation. ?750 ?2418.60 The slope, 0.09, means that Patel's salary, S, increases by ?0.09 for every ?1 increase in his sales. The S-intercept means that when his sales are ?0, his salary is ?750. Costa is planning a lunch banquet. The equation models the relation between the cost in dollars, C, of the banquet and the number of guests, g. Find the cost if the number of guests is 40. Find the cost if the number of guests is 80. Interpret the slope and C-intercept of the equation. Graph the equation. Margie is planning a dinner banquet. The equation models the relation between the cost in dollars, C of the banquet and the number of guests, g. Find the cost if the number of guests is 50. Find the cost if the number of guests is 100. Interpret the slope and C–intercept of the equation. Graph the equation. ?2850 ?4950 The slope, 42, means that the cost, C, increases by ?42 for when the number of guests increases by 1. The C-intercept means that when the number of guests is 0, the cost would be ?750. Use Slopes to Identify Parallel Lines In the following exercises, use slopes and y-intercepts to determine if the lines are parallel. Use Slopes to Identify Perpendicular Lines In the following exercises, use slopes and y-intercepts to determine if the lines are perpendicular.

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