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Chapter 1 : Graphing Inequalities On A Number Line Worksheet â€“ calendrierdelascience.com

Solving and Graphing Inequalities Worksheets. Linear inequality worksheets contain graphing inequalities, writing inequality from the graph, solving one-step, two-step and multi-step inequalities, graphing solutions, solving and graphing compound inequalities, absolute value inequalities and more.

Systems of Equations and Inequalities In previous chapters we solved equations with one unknown or variable. We will now study methods of solving systems of equations consisting of two equations and two variables. Represent the Cartesian coordinate system and identify the origin and axes. Given an ordered pair, locate that point on the Cartesian coordinate system. Given a point on the Cartesian coordinate system, state the ordered pair associated with it. We have already used the number line on which we have represented numbers as points on a line. Note that this concept contains elements from two fields of mathematics, the line from geometry and the numbers from algebra. Rene Descartes devised a method of relating points on a plane to algebraic numbers. This scheme is called the Cartesian coordinate system for Descartes and is sometimes referred to as the rectangular coordinate system. This system is composed of two number lines that are perpendicular at their zero points. Perpendicular means that two lines are at right angles to each other. Study the diagram carefully as you note each of the following facts. The number lines are called axes. The horizontal line is the x-axis and the vertical is the y-axis. The zero point at which they are perpendicular is called the origin. Positive is to the right and up; negative is to the left and down. The arrows indicate the number lines extend indefinitely. Thus the plane extends indefinitely in all directions. The plane is divided into four parts called quadrants. These are numbered in a counterclockwise direction starting at the upper right. Points on the plane are designated by ordered pairs of numbers written in parentheses with a comma between them, such as 5,7. This is called an ordered pair because the order in which the numbers are written is important. The ordered pair 5,7 is not the same as the ordered pair 7,5. Points are located on the plane in the following manner. First, start at the origin and count left or right the number of spaces designated by the first number of the ordered pair. Second, from the point on the x-axis given by the first number count up or down the number of spaces designated by the second number of the ordered pair. Ordered pairs are always written with x first and then y, x,y. The numbers represented by x and y are called the coordinates of the point x,y. The first number of the ordered pair always refers to the horizontal direction and the second number always refers to the vertical direction. Check each one to determine how they are located. What are the coordinates of the origin? Find several ordered pairs that make a given linear equation true. Locate these points on the Cartesian coordinate system. Draw a straight line through those points that represent the graph of this equation. A graph is a pictorial representation of numbered facts. There are many types of graphs, such as bar graphs, circular graphs, line graphs, and so on. You can usually find examples of these graphs in the financial section of a newspaper. Graphs are used because a picture usually makes the number facts more easily understood. In this section we will discuss the method of graphing an equation in two variables. In other words, we will sketch a picture of an equation in two variables. All possible answers to this equation, located as points on the plane, will give us the graph or picture of the equation. A sketch can be described as the "curve of best fit. Remember, there are infinitely many ordered pairs that would satisfy the equation. Solution We wish to find several pairs of numbers that will make this equation true. We will accomplish this by choosing a number for x and then finding a corresponding value for y. A table of values is used to record the data. In the top line x we will place numbers that we have chosen for x. Then in the bottom line y we will place the corresponding value of y derived from the equation. Of course, we could also start by choosing values for y and then find the corresponding values for x. In this example we will allow x to take on the values -3, -2, -1,0, 1,2,3. These values are arbitrary. We could choose any values at all. Notice that once we have chosen a value for x, the value for y is determined by using the equation. These values of x give integers for values of y. Thus they are good choices. Suppose we chose These facts give us the following table of values: We now locate the ordered pairs -3,9 , -2,7 , -1,5 , 0,3 , 1,1 , 2,-1 , 3,-3 on the coordinate plane and connect them with a line. The line indicates that all points on the line satisfy the equation, as well as the points from the table. The arrows

indicate the line continues indefinitely. The graphs of all first-degree equations in two variables will be straight lines. This fact will be used here even though it will be much later in mathematics before you can prove this statement. Such first-degree equations are called linear equations. Equations in two unknowns that are of higher degree give graphs that are curves of different kinds. You will study these in future algebra courses. Since the graph of a first-degree equation in two variables is a straight line, it is only necessary to have two points. However, your work will be more consistently accurate if you find at least three points. Mistakes can be located and corrected when the points found do not lie on a line. We thus refer to the third point as a "checkpoint. You will be surprised how often you will find an error by locating all three points. Example 2 Sketch the graph of 3x - 2y - 7. Solution First make a table of values and decide on three numbers to substitute for x. We will try 0, 1,2. Again, you could also have started with arbitrary values of y. The answer is not as easy to locate on the graph as an integer would be. Sometimes it is possible to look ahead and make better choices for x. The point 1,-2 will be easier to locate. The point 3,1 will be easy to locate. We will readjust the table of values and use the points that gave integers. This may not always be feasible, but trying for integral values will give a more accurate sketch. We can do this since the choices for x were arbitrary. How many ordered pairs satisfy this equation? Associate the slope of a line with its steepness. Write the equation of a line in slope-intercept form. Graph a straight line using its slope and y-intercept. We now wish to discuss an important concept called the slope of a line. Intuitively we can think of slope as the steepness of the line in relationship to the horizontal. Following are graphs of several lines. Study them closely and mentally answer the questions that follow. Which line is steeper? What seems to be the relationship between the coefficient of x and the steepness Which graph would be steeper: Which graph would be steeper: Now study the following graphs. What effect does a negative value for m have on the graph? In mathematics we use the word slope in referring to steepness and form the following definition: Solution We first make a table showing three sets of ordered pairs that satisfy the equation. Remember, we only need two points to determine the line but we use the third point as a check. We then sketch the graph. The value of m is 6, therefore the slope is 6. We may merely write m - 6.

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