COORDINATE GRAPHS AND CHANGES IN QUANTITIES pdf

1: Variables & Representations of Relationships | Minnesota STEM Teacher Center

Unit 9: Coordinate Graphs and Changes in Quantities Chapter 1: The Coordinate Grid Circle the correct option, A, B, C or D. Refer to the grid and answer questions 1 to 3.

Coordinate Graphing Coordinate graphing sounds very dramatic but it is actually just a visual method for showing relationships between numbers. The relationships are shown on a coordinate grid. A coordinate grid has two perpendicular lines, or axes, labeled like number lines. The horizontal axis is called the x-axis. The vertical axis is called the y-axis. The point where the x-axis and y-axis intersect is called the origin. The numbers on a coordinate grid are used to locate points. Each point can be identified by an ordered pair of numbers; that is, a number on the x-axis called an x-coordinate, and a number on the y-axis called a y-coordinate. Ordered pairs are written in parentheses x-coordinate, y-coordinate. The origin is located at 0,0. Note that there is no space after the comma. The location of 2,5 is shown on the coordinate grid below. The x-coordinate is 2. The y-coordinate is 5. To locate 2,5 , move 2 units to the right on the x-axis and 5 units up on the y-axis. The order in which you write x- and y-coordinates in an ordered pair is very important. The x-coordinate always comes first, followed by the y-coordinate. As you can see in the coordinate grid below, the ordered pairs 3,4 and 4,3 refer to two different points! The function table below shows the x- and y-coordinates for five ordered pairs. You can describe the relationship between the x- and y-coordinates for each of these ordered pairs with this rule:

COORDINATE GRAPHS AND CHANGES IN QUANTITIES pdf

2: Coordinate system and ordered pairs (Pre-Algebra, Introducing Algebra) â€“ Mathplanet

Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.

Student Misconceptions and Common Errors Students think that variables represent only one number. Students cannot distinguish between independent and dependent variables. Students misinterpret whether a relationship is additive or multiplicative given a table or graph. Students incorrectly graph the ordered pair x, y. Students believe that the axes have to be scaled in the same units when graphing. Vignette In the Classroom This vignette tells how students use tables, graphs, and rules to explore how many meals they can pack for hungry children during their upcoming field trip. Next week our class will be taking a field trip to pack meals for starving children around the world. It is typical for volunteers to pack approximately meals in two hours. That rate, meals in 2 hours, is a relationship between two variables - time and the number of meals packed. Since the focus of our learning the past few weeks has been to represent relationships using graphs, tables, and rules, I think this situation provides a great opportunity for us to practice those skills. Back to the relationship between time and the number of meals packed. Take a few minutes now to represent this situation using a table. Be prepared to explain how you arrived at your answers. Some students reversed the columns in the table, leading to a discussion about dependent and independent variables. How can this relationship be represented in a graph? We plot these points on a coordinate grid. Does it matter which variable you put on the x-axis and which you put on the y-axis? Yes, the independent variable goes on the x-axis and the dependent variable goes on the y-axis. How did you decide which variable was which? The number of meals packed depends on the number of hours, so the number of hours is the independent variable. Go ahead now and graph this relationship. How do I know if I should draw a line through the points after I plot them? Well, I could pack meals for 2 hours and 15 minutes. That just means you completed meals, and started on the next. I need another piece of graph paper. Tell me how you set up your axes. I counted by ones, but I ran out of room on the y-axis. How else could you organize the y-axis? I could count by 10s or maybe 50s, but I thought you had to use the same scales on both the x- and y- axes. No, then it would be impossible to fit some graphs on a piece of paper. Now go ahead and make your graphs. Does anyone know what rule can be used to predict the number of meals that can be packed for t hours? You must multiply the number of hours times And how would you write that rule algebraically? Which of these representations made it easier to find the rule? The table helped me more because it helped me see what the time needed to be multiplied by to find the number of meals packed. I liked the graph better, because I could see how much y increased for every unit that x increased Teacher: So both representations could be used to find the rule. What is the advantage of knowing the rule? If you know the rule, you can predict the amount of meals made for any amount of hours. Or you could work backwards to predict how long it would take to pack a certain amount of meals. Tell me more about that. You could divide 10, by and that tells you that it would take 80 hours to pack 10, meals. I have one more question for you. To find the number of meals per minute, I need to divide by But I did an easier problem. I rounded to and divided by That gave me 2 meals every minute or 2 meals in 60 seconds. What if we were able to work faster than typical volunteers? How would that impact the number of meals we could pack? There you go again. I suppose we could go through the same process of making a table, graphing the points, and finding the rule. As students begin to explore algebraic representation, they need to understand that a variable represents any value that makes the statement true. A variable, then, may represent one value, many values, or no value. Ask students, "Does the pay depend on the number of hours worked, or does number of hours worked depend on the pay? Since graphs of both additive and multiplicative relationships of two varying quantities can result in lines, it is easy for students to distinguish the relationships using a graph. It is helpful to have students translate the ordered pairs to a table for further examination. However, further misconceptions can occur when using tables. This misconception can be addressed by extending student observations of this pattern to include the relationship between x and y as shown in the table below. Students will also benefit from the opportunity to explore tables of additive and multiplicative relationships

simultaneously. It is important to emphasize that when writing rules, you are expressing the relationship between two variables. It is also important that students have multiple opportunities using a variety of representations to explore additive and multiplicative relationships. The chart below shows an example. When creating tables, the convention is to use the first column row for the independent variable, and the second column row for the dependent variable. When graphing, the convention is to use the x-coordinate to represent the independent variable and the y-coordinate to represent the dependent variable. It is helpful to refer to coordinates as ordered pairs to remind students that order matters. Remind students that the first coordinate represents the distance from 0 on the horizontal axis, while the second coordinate represents the distance from 0 on the vertical axis. It is likely that in previous graphing experiences, students have used the same scale for both axes. However, it is essential that students understand the necessity of using the same interval for each unit on an axis. When writing rules, the convention is to use x to represent the independent variable and y to represent the dependent variable. Remind students that order matters when writing function rules that involve subtraction and division, because those operations are not commutative. Function sense comes from looking for visual and number patterns and predicting outcomes from applying a rule.

COORDINATE GRAPHS AND CHANGES IN QUANTITIES pdf

3: Grade 6 Common Core Standards

To graph the equation x + 2 = y, each ordered pair is located on a coordinate grid, then the points are connected. Notice that the graph forms a straight line. The arrows indicate that the line goes on in both directions.

You may not have time to have each student share. As you filter through the room during pair up time, attempt to identify a group who has understanding, some understanding and little understanding. During the whole group discussion have students debate their responses and defend their thinking. This again will practice MP 3. As the facilitator of the discussion, you can head the discussion with open ended questions that will ask students to defend their answers. Now, plotting these points would not be a conducive strategy here. This would be very time consuming to create a coordinate grid that would accommodate the amount of numbers needed on each axis. What would be another strategy that the students can use? Students should feel comfortable writing the x and y values as ratios and reducing them to their lowest form. Students who have been comfortable using the calculator to reduce fractions will need to practice divisibility rules, finding the GCF, and simple division. This may done through homework assignments, bell ringers, exit tickets, or lunch bunch groups. Students will be tempted to choose the response in which they see a constant change between the x and y values. This will be a great time to discuss how a constant change of multiplication differs from a constant change of addition when determining a proportional relationship between quantities. Go through the correct process in responding to each question. Students will correct mistakes. For example, for question number 1, I would go through eliminating each response that is incorrect first. Response B is eliminated because when each ratio is reduced, none of the ratios are equivalent. Response C is eliminated for the same reason. However, some students may get as far as reducing each ratio and may choose C because they will see a pattern in the reduced ratios. This will be good for the students to understand that the ratios must be equivalent. Exit Ticket For the exit ticket, have students explain why graphing on a coordinate grid would not be a good strategy to use for this bell ringer. Have students create a proportional table that would call for using the graphing strategy and explain the difference between their table and the correct table from question 1.

4: MathSteps: Grade 4: Coordinate Graphing: What Is It?

Coordinate Planes and Graphs A rectangular coordinate system is a pair of perpendicular coordinate lines, called coordinate axes, which are placed So that they intersect at their origins. The labeling of axes with letters x and y is a common convention, but any letters may be used.

5: Dependent & independent variables: graphing | Algebra (video) | Khan Academy

Any graph on a two-dimensional plane is a graph in two ariables.v Suppose we want to graph the equation y = 2x 1:We can begin by substituting a aluev for x into the equation and determining the resulting aluev of y.

6: Coordinate System and Graphing Lines including Inequalities â€“ She Loves Math

To graph inequalities on the coordinate system, we need to graph the line using the "\(\displaystyle y=mx+b\)" formula (or another method, like intercepts), and look which way the inequality sign is, with respect to the positive coefficient of \(\boldsymbol{y}\). The shaded areas will be where the equation "works"; in other words, where.

7: Math Test Papers

indicates a change in position and has a sign indicating the direction of the displacement. The magnitude of that position change is the distance and is always positive.

COORDINATE GRAPHS AND CHANGES IN QUANTITIES pdf

8: Seventh grade Lesson Determine if Two Quantities are in a Proportional Relationship

Determine whether the relationship between the two quantities shown in the table or graph is linear. If so, find the constant rate of change. If not, explain your reasoning.

9: Ratios & Proportional Relationships | Common Core State Standards Initiative

The graph of a proportional relationship between two quantities is a straight line that starts at the origin, (0, 0). These graphs show the proportional relationship between tricycles and wheels. In the graph of $w = 3 t$, the x -axis represents the number of tricycles (t).

COORDINATE GRAPHS AND CHANGES IN QUANTITIES pdf

In troubles arms The perfect health diet book CHAPTER 1 BACKGROUND FOR NEW DISASTERS 3 Walker in the wilderness The Pauline theory of the inspiration of Holy Scripture TCP/IP and routing Developing ideas in artwork Sportplane Resource Guide Security and detente Emi and the rhino scientist Summary of catholic social teaching on development issues Kelly bowen Solidworks flow simulation tutorial 2014 African American communicative practices: improvisation, semantic license, and augmentation Arthur K. Spe Fiona cobb structural engineers handbook History and sociology of clothing : some methodological observations Rod Serlings The Twilight Zone Tan Tien Chi Kung Goethe theory of colours The national incident management system The comparative law of marriage and divorce. Essentials of firefighting and fire department operations 5th edition The Weight of the Image Open source biology Andrew Hessel Joyful and triumphant Matts sand and sea dragon 2018 book of lists san antonio Frida Kahlo: mirror and mask The lake banana yoshimoto Isolation of quiescent murine hematopoietic stem cells by homing properties Tarja A. Juopperi and Saul J. Bravely default design works The role patriarchy plays in our contemporary world situation Leslene della Madre Cuba and Porto Rico, with the other islands of the West Indies The wilderness on foot : LNT guidelines for hikers, climbers, and backcountry skiers Permanent quarantine station at Cape Charles, Virginia. Psychology of musical ability Diction and intelligibility Trader vics bartenders guide The annihilation of space by law: anti-homeless laws and the shrinking landscape of rights Is 2470 part 2