Sept/Oct

Algebra 1

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| --- | --- | --- | --- | --- | --- | --- |
|  | Mon | Tue | | Wed | Thu | Fri |
| Week 6 | Unit 2 – Linear Functions  \*Calendar may change based on student’s need  TEACHER NEEDS TO ADJUST THE CALENDAR TO THEIR NEEDS | | 18  **Unit 1 Test Page 1-3** | | 19  **Unit 1 Test Page 4**  May retake Unit 0 Mastery Test if they have time  **HW:** 2.1 Notes & Check for Understanding | 20  Introduction to Unit 2 Learning Team Activity  PDSA unit 1 |
| Week 7 | 23  AC – Simplifying Expressions  2.1 Q & A  **HW:** 2.2 Notes & Check for Understanding | 24  *Reflection 2.1/2.2*  2.2 Q & A  **HW:** 2.3 Notes & Check for Understanding | | 25  2.3 Q & A  **HW:** 2.4 Notes & Check for Understanding | 26  *Reflection 2.3/2.4*  2.4 Q & A  **HW:** 2.5 Notes & Check for Understanding | 27  AC – Evaluating Expressions    **Learning Team Workday** |
| Week 8 | 30  AC – Solving Proportions  2.5 Q & A  **HW:** 2.6 Notes & Check for Understanding | 1  *Reflection 2.5/2.6*  2.6 Q & A  **HW:** 2.7 Notes & Check for Understanding | | 2  AC – Translating Exp/Eqs  2.7 Q & A  **HW:** 2.8 Notes & Check for Understanding | 3  Pathways  2.8 Q & A | 4  **Early Release**  Staff Development  *Reflection 2.7/2.8*  **Unit 3 Pre-Test** |
| Week 9 | 7  ***LT Activity Due by start of class***  **Review for Test 2** | 8  **Review for Test 2** | | 9  **Unit 2 Test**  Page 1-3 | **10**  **Unit 2 Test**  Page 4  Algebraic Concepts Mastery Test  **HW:** 3.1 Notes & Check for Understanding | 11  **Homecoming Assembly**  Introduction to Unit 3 Learning Team Activity  PDSA unit 2 |

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| **Unit 2: Linear Functions** | |
| **ENDURING UNDERSTANDINGS** | |
| Real world problems can be represented and solved with linear functions. | |
| ESSENTIAL QUESTIONS | KEY CONCEPTS |
| * How can linear functions be used to solve problems? * When is it useful to use a particular form of linear equation (standard, slope-intercept, or point-slope)? * How can functions be described? * How can functions be represented? * How can two different functions represented in different ways be compared? * What does each key feature of a function mean in a given context? * How can the rate of change of a linear function be described? * How can the transformation of a function be described? | 1. Linear functions can be used to represent and solve real world problems. 2. Different forms of linear equations can be useful depending on the context. 3. Functions can be described in terms of key features such as slope, intercepts, domain and range. 4. Linear functions can represented algebraically, graphically, numerically in tables, or by verbal descriptions. 5. Key features of functions can be described in terms of the context of the function. 6. Linear functions grow by equal differences over equal intervals (constant rate of change). 7. Parent functions can be transformed to create new functions. |
| STUDENT FRIENDLY OBJECTIVES | ACADEMIC VOCABULARY |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| * TSW write and solve linear equations. * TSW work with different forms of linear equations. * TSW describe a function given a table or graph. * TSW compare two functions represented in different ways. * TSW describe key features of functions in context. * TSW describe the rate of change of a linear function in context. * TSW describe the transformation of a function. | | |  |  |  | | --- | --- | --- | | linear equation | domain | x-intercept | | linear function | range | y-intercept | | slope intercept form | transformation | slope | | point slope form | parameter | rate of change | | standard form |  | interval | |
| STANDARDS COVERED | | |
| Create Equations | **A-CED.2.** Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. | |
| **A-CED.3.** Represent constraints by equations ~~or inequalities, and by systems of equations and/or inequalities~~, and interpret solutions as viable or non-viable options in a modeling context. | |
| Functions | **F-IF.4.** For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key [*intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity]* features given a verbal description of the relationship*.* | |
| **F-IF.5.** Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. | |
| **F-IF.6.** Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. | |
| **F-IF.7.** Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.  a. Graph linear ~~and quadratic functions~~ and show intercepts, ~~maxima, and minima.~~ | |
| **F-IF.9.** Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). | |
| Build Functions | **F-BF.1.** Write a function that describes a relationship between two quantities.  a. Determine an explicit expression, a recursive process, or steps for calculation from a context. | |
| **F-BF.3.** Identify the effect on the graph of replacing *f*(*x*) by *f*(*x*) + *k*, *k f*(*x*), *f*(*kx*), and *f*(*x* + *k*) for specific values of *k* (both positive and negative); find the value of *k* given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph **using technology**. | |
| Linear Models | **F-LE.1.** Distinguish between situations that can be modeled with linear functions ~~and with exponential functions.~~  a. Prove that linear functions grow by equal differences over equal intervals, ~~and that exponential functions grow by equal factors over equal intervals.~~  b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. | |
| **F-LE.2.** Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table). | |
| **F-LE.5.** Interpret the parameters in a linear or exponential function in terms of a context. | |

**Exit Outcomes Skills:**

* I keep track of my assignments and important dates on my calendar or on my planner.
* I take notes (teacher prepared & impromptu), complete assignments & vocabulary on time.
* I set goals in my planner.
* I manage my time using my planner.
* I keep an organized notebook.
* I self reflect on my performance in my class using my notes, check for understanding, reflections, and activities.
* I ask for help when I need it (teacher, learning team, parent/guardian, HW Lab).
* I spent extra time using the additional resources provided.
* I am an active participate and an asset within my learning team.

**Goal Tracking Sheet:** \*This should be filled in each time feedback is given.  \* Use the exit outcome skills as a guideline to reflect on your results

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ #:\_\_\_\_\_\_\_\_

**PLAN**

**Student Goal** My goal is to achieve a\_\_\_\_\_\_\_\_\_\_ score on the “Chapter 2: Linear Functions” unit test.

**Action Steps** List at least 3 things you plan on doing to be successful in reaching your goal this unit.

(i.e. use flashcards to study and understand vocabulary, reflect on CFU problems that I miss, seek extra help when I do not understand a concept, ask question in class when I can’t find my mistake, try/preserver through all my CFU problems, use additional resources provided to make sure I understand topic, review pretest, etc.)

**STUDY**

**Act**

**Do**

|  |
| --- |
| **Suggestions for improvement:** |
| **Student (What will I do)** |

|  |  |  |
| --- | --- | --- |
| **Activities/**  **Assignments** | **Unit Concepts** | [https://encrypted-tbn0.google.com/images?q=tbn:ANd9GcQdpVrlS9P3GVQ2sGKC13_xyr8FydBnepuuiVQQvN_dUIAmc2ei7A](http://www.google.com/imgres?um=1&hl=en&biw=1024&bih=587&tbm=isch&tbnid=2nocVW5ycs7bkM:&imgrefurl=http://en.wikipedia.org/wiki/File:OCR-A_char_Plus_Sign.svg&docid=JD5k8ALWiXzKZM&imgurl=http://upload.wikimedia.org/wikipedia/commons/3/30/OCR-A_char_Plus_Sign.svg&w=744&h=1052&ei=YdbYT4v_MYHg2QXL6o2kDw&zoom=1&iact=hc&vpx=219&vpy=2&dur=906&hovh=267&hovw=189&tx=99&ty=181&sig=117890709682966998579&page=1&tbnh=109&tbnw=74&start=0&ndsp=21&ved=1t:429,r:1,s:0,i:155)**Was it helpful**  **/** |
| Reflection 2.1 | #3, #4 |  |
| Reflection 2.2 | #2 – 6 |  |
| Reflection 2.3 | #1 – 6 |  |
| Reflection 2.4 | #1 – 6 |  |
| Reflection 2.5 | #1 – 6 |  |
| Reflection 2.6 | #1 – 6 |  |
| Reflection 2.7 | #6 |  |
| Reflection 2.8 | # 6 |  |
| LT Task #1 | # 1, #5 – 6 |  |
| LT Task #2 | # 3, #7 |  |
| LT Task #3 | # 1 – 6 |  |
| LT Task #4 | # 1 – 6 |  |

**STUDY**

Was I on track to meet my goal (use the tracking paper to support your response)? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Did I meet my goal? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What concepts #’s were my best scores? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ What concepts #’s were my lowest scores? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What action steps caused there to be a difference? Why? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What should I try next unit to be more successful? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Give feedback for the teacher. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| **2.1 Write a Function in Slope – Intercept Form** | |
| **Notes** | DVUSD Algebra Flexbook: pg 58 – 61.  A linear function has the form: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  *f* (x) represents \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ so y = ­­­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  where x is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_variable and y is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ variable.  Example A: *f* (x) = 3x – 4. Find *f* (2), f(0), and *f* (-1).  Solution:    Function notation reveals two things: the value of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and the  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.  Example A has three ordered pairs, list them. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Example B: Write and equation for a line with m = 3.5 and *f* (-2) = 1.  Solution:  Example C: Write and equation for a line with *f* (-1) = 2 and *f* (5) = 20.  Solution: ; ; 3.  View: <http://www.ck12.org/flx/render/embeddedobject/83> |
| **Check for Understanding** | 1. Consider the function *f* (x) = -2x – 3. Find *f* (-3), *f* (0), and *f* (5). 2. Consider the function *f* (x)= x + 10. Find *f* (-9), *f* (0), and *f* (9). 3. Find the equation of the linear function in slope-intercept form. 4. m = -2, *f* (0) = 5 b. m = -7, *f* (2) = -1 5. m =  , *f* (-1) =  d. m = 4.2 , *f* (-3) = 7.1 6. *f* = , *f* (0) =  e. *f* (-1)= 1, *f* (1) = -1 |
| **Additional Resources** | * <http://www.youtube.com/watch?v=LO02fndLdwU> * <http://www.algebra.com/algebra/homework/Expressions-with-variables/Expressions-with-variables.faq.question.118753.html> * <http://virtualnerd.com/tutorials/?id=Alg1_10_1_17> |
| **2.2 Graph a Line in Standard Form** | |
| **Notes** | DVUSD Algebra Flexbook: pg 62 – 65.  Example A: Graph 5x – 2y = -15 by rewriting it in slope-intercept form.  Solution:  **Example B:** Find the x and y intercepts of the equation 4x – 3y = 21. \*error in flexbook  Solution:  **Example C:** Graph the equation from Example B.    Intro Problem: Scott and Brook are organizing a fundraiser for their school. They are planning a pasta dinner where adult tickets will cost $16 and kids’ tickets will cost $8. Their goal is to make $2000. Write the equation in Standard Form: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  If they sell only adult tickets, you are looking for t\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ so set the \_\_\_\_\_\_\_\_  The solution is:  If they sell only kid tickets, you are looking for the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ so set the \_\_\_\_\_\_\_\_\_\_\_\_  The solution is:  *View:* [*http://www.virtualnerd.com/algebra-1/linear-equation-analysis/horizontal-line-definition.php*](http://www.virtualnerd.com/algebra-1/linear-equation-analysis/horizontal-line-definition.php)  **Horizontal Lines:**   * Slope: * x-intercept: * y-intercept: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the form of (\_\_\_, \_\_\_) where (a, b) is a point on the line * Is it a function?   *View:* [*http://www.virtualnerd.com/algebra-1/linear-equation-analysis/vertical-line-definition.php*](http://www.virtualnerd.com/algebra-1/linear-equation-analysis/vertical-line-definition.php)  **Vertical Lines:**   * Slope: * x-intercept: \_\_\_\_\_\_\_\_\_ in the form of (\_\_\_, \_\_\_\_) where (a, b) is a point on the line * y-intercept: * Is it a function? |
| **Check for Understanding** | 1. Graph the lines by changing the equation into slope intercept form. Then identify the slope and y-intercept.  a. -2x + y = 5 b. 3x + 8y = 16    Equation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Equation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  m = \_\_\_\_\_\_\_\_\_\_ b = \_\_\_\_\_\_\_\_\_ m = \_\_\_\_\_\_\_\_\_\_ b = \_\_\_\_\_\_\_\_\_      c. x + 4y = -12 d. 9x – 6y = 24  Equation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Equation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  m = \_\_\_\_\_\_\_\_\_\_ b = \_\_\_\_\_\_\_\_\_ m = \_\_\_\_\_\_\_\_\_\_ b = \_\_\_\_\_\_\_\_\_      2. Graph the following lines by finding the x and y intercepts, written as an ordered pair.  a. 2x + 3y = 12 b. 7x + y = -7    x-intercept: \_\_\_\_\_\_\_\_\_\_\_ x-intercept: \_\_\_\_\_\_\_\_\_\_\_    y-intercept: \_\_\_\_\_\_\_\_\_\_ y-intercept: \_\_\_\_\_\_\_\_\_\_\_      c. x – 2y = 8 d. 4x – 8y = -28  x-intercept: \_\_\_\_\_\_\_\_\_\_\_ x-intercept: \_\_\_\_\_\_\_\_\_\_\_    y-intercept: \_\_\_\_\_\_\_\_\_\_ y-intercept: \_\_\_\_\_\_\_\_\_\_\_    e. y = 3 f. x = -5  m = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ m = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  x-intercept: \_\_\_\_\_\_\_\_\_\_\_ x-intercept: \_\_\_\_\_\_\_\_\_\_\_    y-intercept: \_\_\_\_\_\_\_\_\_\_ y-intercept: \_\_\_\_\_\_\_\_\_\_\_        3. Explain which method you think is easier. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  4. Which line(s), y = 4 or x = 4, is a function? Justify. ­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  5. Which line(s), y = 2 or x = -3, is not a function? Justify. ­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **Additional Resources** | * <http://www.virtualnerd.com/algebra-1/linear-equation-analysis/infinite-slope-definition.php> * <http://virtualnerd.com/tutorials/?id=Alg1_10_1_40> * <http://www.youtube.com/watch?v=MVDtL7GCJmk> |
| **2.3 Linear Equations in Point-Slope Form** | |
| **Notes** | DVUSD Algebra Flexbook: pg 66 – 73.  **Vocabulary:**  Point Slope Form is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  **Example 1**  Write the equation of the line in point-slope form, given that the slope = -5 and the y-intercept = 4.  **Solution:**  1. Start with the equation in point-slope form. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  2. Plug in the value of the slope. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  3. Plug in 0 for x0 and 4 for y0. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Therefore, the equation is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  **Example 2**  Write the equation of the line in point-slope form, given that the slope = 3/5 and the point (2,6) is on the line.  **Solution:**  1. Start with the equation in point-slope form. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  2. Plug in the value of the slope. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  3. Plug in 2 for x0 and 6 for y0. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  The equation is\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  **Example 3**  Write the equation of the line in point-slope form, given that the line contains points  (-4, -2) and (8, 12).  **Solution**  1. Start with the equation in point-slope form. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  2. Find the slope using the slope formula. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  3. Plug in the value of the slope. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  4. Plug in -4 for x0 and -2 for y0. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Therefore, the equation is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Now try plugging in the other point from the example above. Use 8 for x0 and 12 for y0    Place both equations in slope intercept form.  **Example 4**  Re-write the following equations in slope-intercept form. (solve for y)  Solution  a)  b)    **Example 5**  Make a graph of the line given by the equation  **Solution**  Lets rewrite the equation  or  The point on the line is and the slope =  First, plot the point on the graph and then apply the slope.      **Example 8**  Anne got a job selling window shades. She receives a monthly base salary and a $6 commission for each window shade she sells. At the end of the month, she adds up her sales and she figures out that she sold 200 window shades and made $2500. Write an equation in point-slope form that describes this situation. How much is Annes monthly base salary?  Lets define our variables  x = y =  We see that we are given the slope and a point on the line:  Anne gets $6 for each shade, so the slope =  She sold 200 shades and made $2500, so the point is  **Summary:**  • The point-slope form of an equation for a line is:  • If you are given the and a on the line:  • Simply plug the point and the slope into the equation.  • If you are given the and of a line:  • Plug the value of m into the equation  • Plug the point into the equation y0 = y-intercept and x0 = 0.  • If you are given two points on the line:  • Use the two points to find the slope using the slope formula:  .  •Plug the value of m into the equation.  • Plug either of the points into the equation as (x0;y0).  • The functional notation of point-slope form is f(x) - f(x0) = m(x-x0). |
| **Check for Understanding** | 1. Find the **equation** of the line using point-slope form. Rewrite your equation in slope intercept form.  |  |  | | --- | --- | | 1. The line has slope – 1/10 and   goes through point (10, 2). | 1. The line has slope -75 and goes through point (0, 125). | | 1. The line goes through the points   (-2, 3) and (-1, -2). | 1. The line goes through points (2, 3) and (0, 3). | | 1. m = -1/5 and f (0) = 7 | 1. m = -12 and f (-2) = 5 | | 1. f (-7) = 5 and f (3) = -4 | 1. f (6) = 0 and f (0) = 6 |     2. Nadia is placing different weights on a spring and measuring the length of the stretched spring. She finds that for a 100 gram weight the length of the stretched spring is 20 cm and for a 300 gram weight the length of the stretched spring is 25 cm.  a. Write an equation in point-slope form that describes this situation.   1. What is the un-stretched length of the spring?   3. Andrew is a submarine commander. He decides to surface his submarine to periscope depth. It takes him 20 minutes to get from a depth of 400 feet to a depth of 50 feet.  a. Write an equation in point-slope form that describes this situation.  b. What was the submarines depth five minutes after it started surfacing? |
| **Additional Resources** | * <http://www.mathsisfun.com/algebra/line-equation-point-slope.html> |
| **2.4 Writing and Comparing Functions** | |
| **Notes** | DVUSD Algebra Flexbook: pg 66 – 73.  A Dependent Variable is  A Function Notation is    Construct a function that represents the table.  What is the y intercept? What is the slope?  The function that represents the height as a function of days is  Graph the function.      Construct a function that represents the table using the slope, a point, and the point slope form.  What is the slope?  The function that represents the legs in terms of arms is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **Check for Understanding** | 1. Graph each function.  a. f (x) = 3x + 1 b. f (x) = 2x + 2  c. f (x) = -2x + 1 d. f (x) = -2x – 5  e. 4x + y = 9 f. f (x) = - 10 + x  2. A migrating monarch butterfly travels 1100 miles. If it flies 30 miles per day, the distance d it still has to travel is a function of days t it has traveled.  a. Write a function rule for the situation.  b. What is the slope of the situation?  3. A writer gets paid a writer’s fee of $3000 plus $1.50 for each copy of the book that is sold.  a. Create a function rule for this situation.   1. What is the slope of this situation?   c. How many books does the writer need to sell to earn $10,000 total? |
| **Additional Resources** | * <http://www.youtube.com/watch?v=JaqG83GOqbw> |
| **2.5 Applications Using Linear Models** | |
| **Notes** | DVUSD Algebra Flexbook: pg 81 – 85.  **Example A:**  Nadia has $200 in her savings account. She gets a job that pays $7.50 per hour and she deposits all her earnings in her savings account. Write the equation describing this problem in slope–intercept form. How many hours would Nadia need to work to have $500 in her account?  **Solution:**  Defining the variables: x = y =  b= m =  Slope intercept =  To answer the question, substitute $500 for the value of y and solve.  **Example B:**  Marciel rented a moving truck for the day. Marciel remembers only that the rental truck company charges $40 per day and some amount of cents per mile. Marciel drives 46 miles and the final amount of the bill (before tax) is $63. What is the amount per mile the truck rental company charges? Write an equation in point-slope form that describes this situation. How much would it cost to rent this truck if Marciel drove 220 miles?  **Solution:**  Define the variables: x = y =  There are two ordered pairs:  Step 1: Begin by finding the slope:  Step 2: Substitute the slope for m and one of the coordinates for (x1;y1):  Step 3: Find out how much it will cost to rent the truck for 220 miles, substitute 220 for the variable x.    **Example C:**  Nimitha buys fruit at her local farmer’s market. This Saturday, oranges cost $2 per pound and cherries cost $3 per pound. She has $12 to spend on fruit. Write an equation in standard form that describes this situation. If she buys 4 pounds of oranges, how many pounds of cherries can she buy?  **Solution:**  Define the variables: x = y =  The equation that describes this situation is:  If she buys 4 pounds of oranges, we substitute x = 4 into the equation and solve for y.  1. A stalk of bamboo of the family Phyllostachys nigra grows at steady rate of 12 inches per day and achieves its full height of 720 inches in 60 days. Write the equation describing this problem in slope–intercept form. How tall is the bamboo 12 days after it started growing?  **Solution:**  1. Define the variables. x = y =  m =  We are told that the plant grows to inches in days, so we have the point .  Start with the slope-intercept form of the line.  Substitute for the slope.  Substitute the point  The bamboo is inches days after it starts growing.  2. Jethro skateboards part of the way to school and walks for the rest of the way. He can skateboard at 7 miles per hour and he can walk at 3 miles per hour. The distance to school is 6 miles. Write an equation in standard form that describes this situation. If Jethro skateboards for 1  2 of an hour, how long does he need to walk to get to school?  Define the variables: x = and y =  The equation that describes this situation is .  If Jethro skateboards of an hour, we substitute into the equation and solve for y.    Jethro must walk of an hour. |
| **Check for Understanding** | 1. Define your variables, then write and solve the equation. **[Choose any 6]**  a. To buy a car, Andrew puts in a down payment of $1500 and pays $350 per month in installments. Write an equation describing this problem in slope-intercept form. How much money has Andrew paid at the end of one year?  x = Equation:  y =  Solution:  b. Anne transplants a rose seedling in her garden. She wants to track the growth of the rose, so she measures its height every week. In the third week, she finds that the rose is 10 inches tall and in the eleventh week she finds that the rose is 14 inches tall. Assuming the rose grows linearly with time, write an equation describing this problem in slope-intercept form. What was the height of the rose when Anne planted it?  x = Equation:  y =  Solution:  c. Ravi hangs from a giant exercise spring whose length is 5 m. When his child Nimi hangs from the spring, his length is 2 m. Ravi weighs 160 lbs. and Nimi weighs 40 lbs. Write the equation for this problem in slope-intercept form. What should we expect the length of the spring to be when his wife Amardeep, who weighs 140 lbs., hangs from it?  x = Equation:  y =  Solution:  d. Petra is testing a bungee cord. She ties one end of the bungee cord to the top of a bridge and to the other end she ties different weights. She then measures how far the bungee stretches. She finds that for a weight of 100 lbs., the bungee stretches to 265 feet and for a weight of 120 lbs., the bungee stretches to 275 feet. Physics tells us that in a certain range of values, including the ones given here, the amount of stretch is a linear function of the weight. Write the equation describing this problem in slope–intercept form. What should we expect the stretched length of the cord to be for a weight of 150 lbs?  x = Equation:  y =  Solution:  e. Nadia is placing different weights on a spring and measuring the length of the stretched spring. She finds that for a 100 gram weight the length of the stretched spring is 20 cm and for a 300 gram weight the length of the stretched spring is 25 cm. Write an equation in point-slope form that describes this situation. What is the unstretched length of the spring?  x = Equation:  y =  Solution:  f. Andrew is a submarine commander. He decides to surface his submarine to periscope depth. It takes him 20 minutes to get from a depth of 400 feet to a depth of 50 feet. Write an equation in point-slope form that describes this situation. What was the submarine’s depth five minutes after it started surfacing?  x = Equation:  y =  Solution:  g. Anne got a job selling window shades. She receives a monthly base salary and a $6 commission for each window shade she sells. At the end of the month, she adds up her sales and she figures out that she sold 200 window shades and made $2500. Write an equation in point-slope form that describes this situation. How much is Anne’s monthly base salary?  x = Equation:  y =  Solution:  h. The farmer’s market sells tomatoes and corn. Tomatoes are selling for $1.29 per pound and corn is selling for $3.25 per pound. If you buy 6 pounds of tomatoes, how many pounds of corn can you buy if your total spending cash is $11.61?  x = Equation:  y =  Solution:  i. The local church is hosting a Friday night fish fry. They sell a fried fish dinner for $7.50 and a baked fish dinner for $8.25. The church sold 130 fried fish dinners and took in $2,336.25. How many baked fish dinners were sold?  x = Equation:  y =  Solution:  j. Andrew has two part-time jobs. One pays $6 per hour and the other pays $10 per hour. He wants to make $366 per week. Write an equation in standard form that describes this situation. If he is only allowed to work 15 hours per week at the $10 per hour job, how many hours does he need to work per week at his $6 per hour job in order to achieve his goal?  x = Equation:  y =  Solution:  k. Anne invests money in two accounts. One account returns 5% annual interest and the other returns 7% annual interest. In order not to incur a tax penalty, she can make no more than $400 in interest per year. Write an equation in standard form that describes this problem. If she invests $5000 in the 5% interest account, how much money does she need to invest in the other account?  x = Equation:  y =  Solution:  2. Mixed Review  a. Write the following equation in slope-intercept form: y-2 = 6(x-3).  b. Tell whether (4, –3) is a solution to 5x+3y = 9. |
| **Additional Resources** | * <http://www.virtualnerd.com/algebra-1/linear-equations-solve> |
| **2.6 Rates of Change** | |
| **Notes** | DVUSD Algebra Flexbook: pg 86 – 90  **Finding the Rate of Change**  When finding the slope of real-world situations, it is often referred to as rate of change. “Rate of change” means the If you are asked to find the rate of change, use the slope formula.  **Example A**  Andrea has a part-time job at the local grocery store. She saves for her vacation at a rate of $15 every week. Find her rate of change.  **Solution:**  Begin by finding a function that represents the situation.  Now find two ordered pairs. You can make a chart or use the Substitution Property to find two coordinates.   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **x** |  |  |  |  |  |  |  | | **y** |  |  |  |  |  |  |  |     Use the slope formula to find the slope    **Example B**  A candle has a starting length of 10 inches. Thirty minutes after lighting it, the length is 7 inches. Determine the rate of change in the length of the candle as it burns. Determine how long the candle takes to completely burn to nothing.  **Solution:**  Begin by finding two ordered pairs.  The candle begins at 10 inches in length. So at time “zero”, the length is 10 inches. The ordered pair representing this is 30 minutes later, the candle is 7 inches, so the ordered pair is . Since is written first, it can be called (x1;y1). That means = (x2;y2).   |  |  | | --- | --- | | Use the formula:    The candle has a rate of change of  To find the length of time it will take for the candle to burn out, create a graph. |  |   You create a graph to help visualize the situation. By plotting the ordered pairs you found and by drawing a straight line connecting them, you can estimate it will take 100 minutes for the candle to burn out.  **Example C**  Examine the following graph. It represents a journey made by a large delivery truck on a particular day. During the day, the truck made two deliveries, each one taking one hour. The driver also took a one-hour break for lunch. Identify what is happening at each stage of the journey (stages A through E). Truck’s Distance from Home by Time     |  |  | | --- | --- | |  | Here is the driver’s journey.  A. The truck sets off and travels 80 miles in 2 hours.  B. The truck covers no distance for 1 hour.  C. The truck covers (120-80) = 40 miles in 1 hour.  D. The truck covers no distance for 2 hours.  E. The truck covers 120 miles in 2 hours |   **Solution:**  To identify what is happening at each leg of the driver’s journey, you are being asked to find each rate of change. The rate of change for line segment A can be found using the slope formula.    Find the slope (rate of change) of segment A. Slope = rise/run = 80 miles/2 hours =  Segments B and D are horizontal lines and each has a slope of  Find the slope (rate of change) of segment C  Find the slope (rate of change) of segment E  The truck is traveling at negative 60 mph. A better way to say this is that the truck is returning  home at a rate of 60 mph. |
| **Check for Understanding** | 1. How is slope related to rate of change? In what ways is it different?  2. The graph below is a distance-time graph for Mark’s 3.5-mile cycle ride to school. During this particular ride, he rode on cycle paths but the terrain was hilly. His speed varied depending upon the steepness of the hills. He stopped once at a traffic light and at one point he stopped to mend a tire puncture. Identify each section of the graph accordingly.   |  |  | | --- | --- | |  |  |   3. Four hours after she left home, Sheila had traveled 145 miles. Three hours later she had traveled 300 miles. What was her rate of change?  4. Jenna earns $60 every two and a half weeks. What is her rate of change?  5. Geoffrey has a rate of change of 10 feet/1 second. Write a situation that could fit this slope. |
| **Additional Resources** | * <http://www.youtube.com/watch?v=Iqws-qzyZwc> |
| **2.7 Linear and Non-Linear Function Distinction** | |
| **Notes** | DVUSD Algebra Flexbook: pg 91 – 99  Practice identifying whether each represents a linear or a non-linear function.  **Example A**   |  |  | | --- | --- | |  | **Solution**:  **Justification:** As the x-values increase, the y-values are scattered. The points do not fall in a straight line. |   **Example B**   |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | **x** | **y** | | 1 | 10 | | 2 | 8 | | 3 | 6 | | 4 | 4 |   **TABLE 2.5:** | **Solution**:  **Justification:** As the x-values increase by 1, the y- values decrease by 2. If graphed, the points would be linear. |  |  | | --- | |  |   **Example C**   |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | **x** | **y** | | 1 | 8 | | 2 | 6 | | 3 | 4 | | 4 | 2 |   **TABLE 2.6:** | **Solution**:  **Justification:** As the x-values by , the y- values by . If graphed, the points would be . |   Jana loves roller coasters. She can’t wait to ride some of the roller coasters at the amusement park for the class trip. Jana is so curious about roller coasters that she starts to do some research about them. For example, Jana wonders whether or not the speed of the roller coaster is connected to the height of the roller coaster or the length of the roller coaster. She thinks that the speed of the roller coaster is a function of its height.  After doing some research, here is what Jana discovers.   |  |  |  | | --- | --- | --- | | The Timber Terror Roller Coaster  Height =  Speed = | Top Thrill Dragster Roller Coaster  Height =  Speed = | Kingda Ka Roller Coaster  Height =  Speed = |   To create a table of Jana’s data we must use the height as one variable and the speed as the other. Here is a table of our data.   |  |  | | --- | --- | | **H** | **S** | |  |  | |  |  | |  |  |   **TABLE 2.7:**    You can see that as the height the speed Using this information, Jana can conclude that the  Let’s create a graph of the function.   |  |  | | --- | --- | |  |  |   Notice that this graph is a . Even though the speed with the height of the roller coaster, Therefore, the graph of this function is  **Vocabulary:**  **Function -**  **Linear Function** -  **Non-Linear Function** - |
| **Check for Understanding** | 1. Look at each table and justify whether the function is linear or non-linear. Then graph the function.   |  |  | | --- | --- | | **x** | **y** | | **0** | **2** | | **1** | **3** | | **2** | **5** | | **4** | **4** |  1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   **Justification: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**   |  |  | | --- | --- | | **x** | **y** | | **1** | **3** | | **2** | **5** | | **3** | **7** | | **4** | **9** |  1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   **Justification: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**   |  |  | | --- | --- | | **x** | **y** | | **2** | **6** | | **3** | **9** | | **5** | **15** | | **6** | **18** |  1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   **Justification: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**   |  |  | | --- | --- | | **x** | **y** | | **2** | **3** | | **3** | **4** | | **6** | **7** | | **8** | **9** |  1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   **Justification: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**   |  |  | | --- | --- | | **x** | **y** | | **8** | **4** | | **6** | **12** | | **2** | **8** | | **0** | **0** |  1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   **Justification: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
| **Additional Resources** | * <http://www.youtube.com/watch?v=XJm3gzLUpDM> * <http://www.youtube.com/watch?v=Pt-Tn6L60-o> |
| **2.8 Comparing Function Models** | |
| **Notes** | DVUSD Algebra Flexbook: pg 100– 109.    View: ­­­­­­­­­­­­­­­­­<http://www.ck12.org/flx/render/embeddedobject/52908>  Give an example of a:  linear function: \_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  quadratic function: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  exponential function: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  In real-world applications, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that describes some physical situation is not given; it has to  be found so \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Scientists must figure out which  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.  One method for identifying functions is to look at the difference or the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_    **Example A**: Determine if the function represented by the following table of values is linear.     |  |  | | --- | --- | | x | y | | -2 | -4 | | -1 | -1 | | 0 | 2 | | 1 | 5 | | 2 | 8 |     Another way to find linear functions is to use \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. We can use \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.  To find quadratic functions differences can also be used. When the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ increase  by the same amount, the difference between the \_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ will not be the same. However, the difference of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the \_\_\_\_\_ \_\_\_\_\_\_\_\_\_ will be the same.     |  |  | | --- | --- | | x | y = x | | 0 | 1 | | 1 | 1 | | 2 | 4 | | 3 | 9 | | 4 | 16 | | 5 | 25 | | 6 | 36 |         As the x-value increases by 1 the y-value increases by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. However, it increases at a constant rate, so the \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is always \_\_\_\_\_\_\_\_\_\_.     |  |  | | --- | --- | | x | y = x | | 0 | 1 | | 1 | 0 | | 2 | 3 | | 3 | 10 | | 4 | 21 | | 5 | 36 | | 6 | 55 |   *\*error in table from*  *flexbook – values in this*  *table are correct*  *\*student should find correct*  *explanation based on*  *correct values in table*  **Example B:**  Determine if the function represented by each table of values is exponential.       |  |  | | --- | --- | | x | y | | 0 | 4 | | 1 | 12 | | 2 | 36 | | 3 | 108 | | 4 | 324 |     Ratio of the y-values:      2.   |  |  | | --- | --- | | x | y | | 0 | 240 | | 1 | 120 | | 2 | 60 | | 3 | 30 | | 4 | 15 |   Ratio of the y-values:  The function will be exponential when: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  **Example C:**   |  |  | | --- | --- | | x | y | | 0 | 5 | | 1 | 1 | | 2 | -3 | | 3 | -7 | | 4 | -11 |   Difference of the y-values:  The function is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because as each x-value \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the y-value \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  The equation would be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.  **Example D:**   |  |  | | --- | --- | | x | y | | 0 | 0 | | 1 | 5 | | 2 | 20 | | 3 | 45 | | 4 | 80 | | 5 | 125 | | 6 | 180 |   Difference of the y-values:  When the x-value \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, the difference between the y-values \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Since the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is constant, the function is \_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_.  View: <http://www.ck12.org/flx/render/embeddedobject/52909>  If the difference of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is **always** the same, the function is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.  If the difference of the \_\_\_\_\_\_\_\_\_ of the \_\_\_\_\_\_\_ \_\_\_\_\_\_\_ is **always** the same, the function is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.  If the ratio of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is **always** the same, the function is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **Check for Understanding** | 1. Determine whether the data in the following tables can be represented by a linear function.  Justify your answer.  a. b. c.     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  |  | | --- | --- | | x | y | | -4 | 10 | | -3 | 7 | | -2 | 4 | | -1 | 1 | | 0 | -2 | | 1 | -5 | | |  |  | | --- | --- | | x | y | | -2 | 4 | | -1 | 3 | | 0 | 2 | | 1 | 3 | | 2 | 6 | | 3 | 11 | | |  |  | | --- | --- | | x | y | | 0 | 50 | | 1 | 75 | | 2 | 100 | | 3 | 125 | | 4 | 150 | | 5 | 175 | |   2. Determine whether the data in the following tables can be represented by an exponential function. Justify your answer.   |  |  | | --- | --- | | x | y | | 0 | 4000 | | 1 | 2400 | | 2 | 1440 | | 3 | 864 | | 4 | 518.4 | | 5 | 311.04 |  |  |  | | --- | --- | | x | y | | 0 | 120 | | 1 | 180 | | 2 | 270 | | 3 | 405 | | 4 | 607.5 | | 5 | 911.25 |   a. b. c.   |  |  | | --- | --- | | x | y | | 0 | 200 | | 1 | 300 | | 2 | 1800 | | 3 | 8300 | | 4 | 25800 | | 5 | 62700 |     3. Determine what type of function represents the values in the tables. Justify your answer.   |  |  | | --- | --- | | x | y | | -3 | 14 | | -2 | 4 | | -1 | -2 | | 0 | -4 | | 1 | -2 | | 2 | 4 |   a. b. c.   |  |  | | --- | --- | |  | y | | 0 | 400 | | 1 | 500 | | 2 | 625 | | 3 | 781.25 | | 4 | 976.5625 |  |  |  | | --- | --- | | x | y | | -9 | -3 | | -7 | -2 | | -5 | -1 | | -3 | 0 | | -1 | 1 | | 1 | 2 | |
| **Additional Resources** | * <http://www.youtube.com/watch?v=ZjUuR_SGssg> * <http://wiki.answers.com/Q/What_is_the_difference_between_linear_and_exponential_growth> |