## Coordinate Algebra: Unit 3 – Linear and Exponential Functions

### PARENT RESOURCE

This resource is merely a supplement to what the students are doing in their classroom. It is meant to serve as additional support for the students as they work with their parents at home. These are suggested materials and are additional help for homework and practice assignments.

<table>
<thead>
<tr>
<th><strong>Unit Overview:</strong></th>
<th>In earlier grades, your students defined, evaluated, and compared functions, and used them to model relationships between quantities. In this unit, your students will learn function notation and develop the concepts of domain and range. They move beyond viewing functions as processes that take inputs and yield outputs and start viewing functions as objects in their own right. They explore many examples of functions, including sequences; they interpret functions given graphically, numerically, symbolically, and verbally, translate between representations, and understand the limitations of various representations. They work with functions given by graphs and tables, keeping in mind that, depending upon the context, these representations are likely to be approximate and incomplete. Their work includes functions that can be described or approximated by formulas as well as those that cannot. When functions describe relationships between quantities arising from a context, students reason with the units in which those quantities are measured. Students build on and informally extend their understanding of integer exponents to consider exponential functions. They compare and contrast linear and exponential functions, distinguishing between additive and multiplicative change. They interpret arithmetic sequences as linear functions and geometric sequences as exponential functions.</th>
</tr>
</thead>
<tbody>
<tr>
<td>This unit lays the foundation for the entire course.</td>
<td>The concept of a function is threaded throughout each unit in Coordinate Algebra and acts as a bridge to future courses. Your students will develop a critical understanding of the concept of a function by examining linear functions and comparing and contrasting them with exponential functions. Note that exponential functions are restricted to those of the form: $f(x) = b^x + k$, where $b &gt; 1$, $k$ is an integer and $x$ is any real number.</td>
</tr>
</tbody>
</table>
Solving Equations Graphically

LESSON ESSENTIAL QUESTION: How can graphs of linear or exponential equations be used to solve problems?

LEARNING TARGETS:
I can ...
• identify solutions and non-solutions of linear and exponential equations.
• graph points that satisfy linear and exponential equations.
• explain why a continuous curve or line contains an infinite number of points on the curve, each representing a solution to the equation modeled by the curve.
• approximate or find solutions of a system of two functions (linear and/or exponential) using graphing technology or a table of values.
• explain what it means when two curves \( y = f(x) \) and \( y = g(x) \) intersect i.e. what is the meaning of \( x \) and what is the meaning of \( f(x) = g(x) \).
• graph a system of linear equations, find or estimate the solution point, and explain the meaning of the solution in terms of the system.

CONCEPT OVERVIEW: Beginning with simple, real-world examples help your students recognize a graph as a set of solutions to an equation. For example, if the equation \( y = 6x + 5 \) represents the amount of money paid to a babysitter (i.e., $5 for gas to drive to the job and $6/hour to do the work), then every point on the line represents an amount of money paid, given the amount of time worked.

Explore visual ways to solve an equation such as \( 2x + 3 = x - 7 \) by graphing the functions \( y = 2x + 3 \) and \( y = x - 7 \). Your students should recognize that the intersection point of the lines is at \((-10, -17)\). They should be able to verbalize that the intersection point means that when \( x = -10 \) is substituted into both sides of the equation, each side simplifies to a value of \(-17\). Therefore, \(-10\) is the solution to the equation. This same approach can be used whether the functions in the original equation are linear, nonlinear or both.

Using technology, have your student graph a function and use the trace function to move the cursor along the curve. Discuss the meaning of the ordered pairs that appear at the bottom of the calculator, emphasizing that every point on the curve represents a solution to the equation. Begin with simple linear equations and how to solve them using the graphs and tables on a graphing calculator. Then, advance your student to nonlinear situations so they can see that even complex equations that might involve quadratics, absolute value, or rational functions can be solved fairly easily using this same strategy. While a standard graphing calculator does not simply solve an equation for the user, it can be used as a tool to approximate solutions.

Students will use the table function on a graphing calculator to solve equations. For example, to solve the equation \( x^2 = x + 12 \), students can examine the equations \( y = x^2 \) and \( y = x + 12 \) and determine that they intersect when \( x = 4 \) and when \( x = -3 \) by examining the table to find where the \( y \)-values are the same.

All students need to understand that numerical solution methods (data in a table used to approximate an algebraic function) and graphical solution methods may produce approximate solutions, and algebraic solution methods produce precise solutions that can be represented graphically or numerically. Students may use graphing calculators or programs to generate tables of values, graph, or solve a variety of functions.

IMPORTANT VOCABULARY:
\( x \)-coordinate \—— the first number in an ordered pair
Intersection \—— the ordered pair or set of elements common to both equations or inequalities
Solution \—— a replacement for the variable in an open sentence that results in a true sentence
Linear function \—— a function that can be written in the form \( y = mx + b \), where \( x \) is the independent variable and \( m \) and \( b \) are real number. Its graph is a line.
SAMPLE PROBLEM:

1. Given a graph of the equation $x + 3y = 6$, find three solutions that will satisfy the equation.

Commentary

A mathematical equation is either true or false. The solution of an equation is the value(s) of the variable(s) that make the equation a true statement. Solving an equation means finding replacement values for the variable that make a true sentence. A linear equation has a graph that is a straight line. The solutions of an equation with two variables are ordered pairs. An equation with two variables usually has an infinite number of solutions.

Solution

Solve for $y$ and enter the equation $y = -\frac{1}{3}x + 2$ into the graphing calculator. The table from the graphing calculator shows all points that are solutions to the equation, or all points that are on the line.

If students don’t have graphing calculators, after they solve for $y$, students could choose $x$ values that are multiples of 3 to clear the fraction and make the problem simpler.

Virtual Resources: Solving Equations Graphically

- [http://www.youtube.com/watch?v=sS0BVEvVmlQ](http://www.youtube.com/watch?v=sS0BVEvVmlQ)
- [http://www.youtube.com/watch?v=IN3jpyOSnRw&feature=relmfu](http://www.youtube.com/watch?v=IN3jpyOSnRw&feature=relmfu)
Interpreting Functions

LESSON ESSENTIAL QUESTION: How can functions be used to represent relationships between quantities?

LEARNING TARGETS:
I can ...
• define functions and explain what they are in my own words.
• use function notation, evaluate functions at any point in the domain, give general statements about how \( f(x) \) behaves at different regions in the domain (as \( x \) gets very large or very negative, close to 0 etc.), and interpret statements that use function notation.
• explain the difference and relationship between domain and range.
• state, and/or find, the domain and range of a function from a function equation, table or graph.
• look at data (from a table, graph, or set of points) and determine if the data is a function and explain my conclusion.
• write a function from a sequence or a sequence from a function.
• explain how an arithmetic or geometric sequence is related to its algebraic function notation.
• write arithmetic and geometric sequences recursively.
• write an explicit formula for arithmetic and geometric sequences.
• connect arithmetic sequences to linear functions and geometric sequences to exponential functions and explain those connections.
• interpret \( x \) and \( y \) intercepts, where the function is increasing or decreasing, where it is positive or negative, its end behaviors, given the graph, table or algebraic representation of a function in terms of the context of the function. (Only linear and exponential).
• find and/or interpret appropriate domains and ranges for linear and exponential functions.
• explain the relationship between the domain of a function and its graph in general and/or to the context of the function.
• calculate and interpret the average rate of change over a given interval of a function from a function equation, graph or table, and explain what that means in terms of the context of the function.
• estimate the rate of change of a function from its graph at any point in its domain.
• accurately graph a linear function by hand by identifying key features of the function such as the \( x \)- and \( y \)-intercepts and slope.
• graph a linear or exponential function using technology.
• sketch the graph of an exponential function accurately identifying \( x \)- and \( y \)-intercepts and asymptotes.
• describe the end behavior of an exponential function (what happens as \( x \) goes to positive or negative infinity).
• discuss and compare two different functions (linear and/or exponential) represented in different ways (tables, graphs or equations). Discussion and comparisons should include: identifying differences in rates of change, intercepts, and/or where each function is greater or less than the other.

CONCEPT OVERVIEW: There are five important ideas to consider when thinking about functions.

1. **Definition** – A function is a rule that assigns each element of set \( A \) to a unique element of set \( B \).
   • Thus, a function is a mapping of some element from a domain (set \( A \)) into a range (set \( B \)). While most of the time we think of the domain and range as being sets of numerical values, this is not always the case. It is important that students understand that a function can operate on non-numerical values.
     o Example: An amusement park has a sign that displayed in front of the bumper car that says a person must be at least 4 feet tall to get on the ride. If John is 3 feet 11 inches, the rule assigns him to the group of non-riders. Susan is 4 feet 2 inches, so according to the rule (function) Susan is assigned to the group of riders.
     o Example: Applying rigid motion to a triangle. The triangle is the input or domain. The rotations, reflections, translations the triangle is put through are the function “rules” and the final transformed triangle is the output or range. (See Unit 5 & 6 of this course)

2. **Covariance and rate of change**: The independent and dependent variables of a function have a covariant relationship. Patterns in how the two variables change together, let us know to which family of functions a particular function belongs. Examining the rate of change of a function gives us some important information. (Difference tables are valuable tools for examining rates of change.)

3. **Families of Functions**: Functions that share the same type of rate of change belong to the same family of functions. A linear function will have a constant rate of change. An exponential function has a rate of change that is proportional to the function value. In this course, students will need to be able to discern between linear and exponential functions. In later courses, students will explore quadratic, exponential and trigonometric functions. Note that sequences – both arithmetic and geometric – can be considered to be functions where the domain is restricted to only the positive integers.
4. **Combining and Transforming Functions**: Under certain conditions, it is possible to add, subtract, multiply or divide functions, as well as to compose functions together. It is also possible to create transformations of functions in predictable ways. There are patterns in transformations of functions which are consistent across all different families of functions. These are helpful when graphing functions. Under appropriate conditions, functions have inverses which “undo” them.

5. **Multiple Representations of Functions**: Functions have multiple representations – Algebraic equations, Table, Graph, Verbal descriptions and Context. Students should be comfortable with all representations and be fluent in moving between representations. They should understand that changing the representation does NOT change the function. Each different representation can help students understand a different facet of a function. Certain representations are more useful in certain contexts. Understanding the links between different representations is critical in gaining a deeper understanding of a function. For example: What does the rate of change (slope) of a linear function look like in a table? On a graph? In an algebraic equation? In a verbal description?

The use technology will be prominent in this unit – use graphing calculators, Excel or an online graphing utility.

Students should distinguish between relationships that are not functions and those that are functions (e.g., present a table in which one of the input values results in multiple outputs to contrast with a functional relationship). They will examine graphs of functions and non-functions, recognizing that if a vertical line passes through at least two points in the graph, then y (or the quantity on the vertical axis) is not a function of x (or the quantity on the horizontal axis).

Your students should examine a table of related quantities and identify features in the table, such as intervals on which the function increases, decreases, or exhibits periodic behavior. They should recognize appropriate domains of functions in real-world settings. For example, when determining a weekly salary based on hours worked, the hours (input) could be a rational number, such as 25.5. However, if a function relates the number of cans of soda sold in a machine to the money generated, the domain must consist of whole numbers.

Given a table of values, such as the height of a plant over time, your students can estimate the rate of plant growth. Also, if the relationship between time and height is expressed as a linear equation, they should explain the meaning of the slope of the line. Finally, if the relationship is illustrated as a linear or non-linear graph, the student should select points on the graph and use them to estimate the growth rate over a given interval.

Explore both linear and exponential function and help students to make connections in terms of general features. Examine multiple real-world examples of exponential functions so that students recognize that a base between 0 and 1 (such as an equation describing depreciation of an automobile that depreciates 20% per year over the course of x years) results in an exponential decay, while a base greater than 1 (such as the value of an investment over time [represents the value of an investment of $5,000 when increasing in value by 7% per year for x years] illustrates growth.

\[
f(x)=15,000(0.8)^x \\
f(x)=5,000(1.07)^x
\]

**IMPORTANT VOCABULARY:**
- **Polynomial function** – a function of the form \( f(x) = a_n x^n + a_{n-1} x^{n-1} + \ldots + a_1 x + a_0 \) where \( a_n \neq 0 \), \( a_0, a_1, a_2, \ldots a_n \) are real numbers, and the exponents are all whole numbers.
- **Rational function** – a function in the form \( f(x) = p(x)/g(x) \) where \( p(x) \) and \( g(x) \) are polynomials and \( g(x) \neq 0 \).
- **Absolute Value function** – a function that contains an absolute value expression
- **Exponential function** – a function that involves the expression \( b^x \) where the base \( b \) is a positive number other than 1.

**SAMPLE PROBLEM:**

1. Which has a greater slope?
   - \( f(x) = 3x + 5 \)
   - A function representing the number of bottle caps in a shoebox where 5 are added each time.

**Commentary**
Slope measures the rate of change in the dependent variable as the independent variable changes. The greater the slope the steeper
the line. When the slope, $m$, is positive, the line slants upward to the right. The more positive $m$ is, the steeper the line will slant upward to the right.

**Solution**

This linear function: $f(x) = mx + b$; the slope of the line is $m$.

- $f(x) = 3x + 5$, the slope is 3
- $f(x) = x + 5$, is the function that represents the bottle caps in the shoebox, the slope is 1

The first function has a greater slope.

---

**Virtual Resources: Interpreting Functions**

- [http://www.dummies.com/how-to/content/how-to-interpret-function-graphs.html](http://www.dummies.com/how-to/content/how-to-interpret-function-graphs.html)
Building Functions

LESSON ESSENTIAL QUESTION: In what ways can functions be combined to create new functions?

LEARNING TARGETS:
I can …
• write a function that describes a linear or exponential relationship between two quantities.
• combine different functions using addition, subtraction, multiplication, division and composition of functions to create a new function.
• write arithmetic and geometric sequences recursively.
• write an explicit formula for arithmetic and geometric sequences.
• connect arithmetic sequences to linear functions and geometric sequences to exponential functions and explain those connections.
• identify and explain (in words, pictures or with tables) the effect “k” on a graph of \( f(x) \) i.e \( f(x) + k \), \( kf(x) \), \( f(kx) \), and \( f(x + k) \).
• find the value of “k” given the graphs.
• recognize even and odd functions from their graphs and algebraic expressions.

CONCEPT OVERVIEW:
Students will be provided a real-world example (e.g., a table showing how far a car has driven after a given number of minutes, traveling at a uniform speed), and examine the table by looking “down” the table to describe a recursive relationship, as well as “across” the table to determine an explicit formula to find the distance traveled if the number of minutes is known.

Help them write out terms in a table in an expanded form to help students see what is happening. For example, if the y-values are 2, 4, 8, 16, they could be written as 2, 2(2), 2(2)(2), 2(2)(2)(2), etc., so that students recognize that 2 is being used multiple times as a factor.

Focus on one representation and its related language – recursive or explicit – at a time so that students are not confusing the formats. A recursive formula is one in which each succeeding term is formulated from one or more previous terms. An explicitly defined formula is one where \( f(x) \) or \( y \) can be solved for, and each term can be calculated by simply plugging in a specific input for \( x \).

They will use graphing calculators or computers to explore the effects of a constant in the graph of a function. For example, your students should be able to distinguish between the graphs of \( y = 2^x \), \( y = 2 \cdot 2^x \), \( y = (\frac{1}{2}) \cdot 2^x \), \( y = 2^x + 2 \), and \( y = 2^{(x+2)} \). This can be \( \frac{1}{2} \) accomplished by allowing students to work with a single parent function and examine numerous parameter changes to make generalizations.

Students can distinguish between even and odd functions by recognizing that a function is even if \( f(-x) = f(x) \) and is odd if \( f(-x) = -f(x) \).

IMPORTANT VOCABULARY:
Logarithmic function – the inverse of the exponential function \( y = b^x \) denoted by \( y = \log_b x \)
System of Equations – a set of two equations that can be written in the form of \( Ax + By = C \) and \( Dx + Ey = F \) where \( x \) and \( y \) are variables, \( A \) and \( B \) are not both zero, and \( D \) and \( E \) are not both zero.
Substitution property – if \( a = b \), then \( a \) may be replaced by \( b \).

SAMPLE PROBLEM(s):

1. Write two formulas that model the pattern: 3, 9, 27, 81……

Commentary

Functions can be defined explicitly, by a formula in terms of the variable. We can also define functions recursively, in terms of the same function of a smaller variable. In this way, a recursive function “builds” on itself. A recursive formula may list the first two (or more) terms as starting values, depending upon the nature of the sequence. In such cases, the \( a_n \) portion of the formula is dependent
upon the previous two (or more) terms.

Solution

Explicit formula:  
\[ a_n = 3^n \]

Recursive formula:  
\[ a_1 = 3 \]
\[ a_n = 3a_{n-1} \]

Certain sequences, such as this geometric sequence, can be represented in more than one manner. This sequence can be represented as either an explicit formula or a recursive formula.

2. Graph the following on a single set of axes:

\[ f(x) = 2^x \]
\[ f(x) = 2^x + 1 \]
\[ f(x) = 2^x + 2 \]
\[ f(x) = 2^x - 1 \]
\[ f(x) = 2^x - 2 \]

Compare and contrast the characteristics of these graphs.

Commentary

Exponential functions are functions written in the form \( f(x) = a^x \), where \( a \) is the base and is positive and \( a \neq 1 \), and \( x \) is a real number. In general, when we have an exponential in the form \( f(x) = a^x \pm k \) then the graph will be moved up or down \( k \) units.

Solution

The graph increases to the right of the \( y \)-axis and decrease to the left. The graph \( f(x) = 2^x \) (red) passes through the point \((0, 1)\). The reason for that, remember, is that any non-zero real number raised to the 0 power has a value of 1. The graph of \( f(x) = 2^x + 1 \) (blue) shifts the graph up 1 space and passes through the point \((0,2)\); the graph of \( f(x) = 2^x + 2 \) (purple) shifts the graph up 2 spaces and passes through the point \((0,3)\), the graph of \( f(x) = 2^x - 1 \) (green) shifts the graph down 1 space and passes through the point \((0,0)\), and the graph of \( f(x) = 2^x - 2 \) (brown) shifts the graph down 2 spaces and passes through the point \((0,-1)\).
Virtual Resources: Building Functions

- [http://www.youtube.com/watch?v=SsgVAuuc5v4](http://www.youtube.com/watch?v=SsgVAuuc5v4)
Linear and Exponential Models

**LESSON ESSENTIAL QUESTION:** How can linear and exponential functions be used to represent problems in real life contexts?

**LEARNING TARGETS:**
I can ...

- distinguish between situations that can be modeled with linear and exponential functions.
- prove (using words, pictures, numbers and/or difference tables) that linear functions grow by equal differences over equal intervals.
- prove (using words, pictures, numbers and/or difference table) that exponential functions grow by equal factors over equal intervals.
- recognize situations with a constant rate of change.
- recognize situations that can be modeled linearly or exponentially and describe the rate of change per unit as constant or the growth factor as a constant percent.
- recognize situations in which a quantity either grows or decays by a constant percent rate.
- construct a linear function given an arithmetic sequence, a graph, a description of a relationship or a table of input-output pairs.
- construct an exponential function given a geometric sequence, a graph, a description of a relationship or a table of input-output pairs.
- explain why a quantity increasing exponentially will eventually exceed a quantity increasing linearly.
- interpret and explain the parameters in an exponential function in terms of a given context (authentic situation, graph, symbolic representation.)

**CONCEPT OVERVIEW:** Tabular representations of a variety of functions can be compared to show that linear functions have a first common difference (i.e., equal differences over equal intervals), while exponential functions do not (instead function values grow by equal factors over equal x-intervals).

Linear and exponential functions will be applied to real-world situations. For example, a person earning $10 per hour experiences a constant rate of change in salary given the number of hours worked, while the number of bacteria on a dish that doubles every hour will have equal factors over equal intervals.

Examples of arithmetic and geometric sequences in graphic, verbal, or tabular forms will be given, and students will generate formulas and equations that describe the patterns.

Students use a graphing calculator or computer program to compare tabular and graphic representations of exponential and polynomial functions to show how the y (output) values of the exponential function eventually exceed those of polynomial functions.

Have your students draw the graphs of exponential and other polynomial functions on a graphing calculator or computer utility and examine the fact that the exponential curve will eventually get higher than the polynomial function’s graph. A simple example would be to compare the graphs (and tables) of the functions $y = x^2$ and $y = 2^x$ and to find that the y values are greater for the exponential function when $x > 4$.

Students will investigate functions and graphs modeling different situations involving simple and compound interest. Students will compare interest rates with different periods of compounding (monthly, daily) and compare them with the corresponding annual percentage rate. Spreadsheets and applets can be used to explore and model different interest rates and loan terms.

Students will use graphing calculators or programs, spreadsheets, or computer algebra systems to construct linear and exponential functions.

Real-world contexts will be used to help students understand how the parameters of linear and exponential functions depend on the context. For example, a plumber who charges $50 for a house call and $85 per hour would be expressed as the function $y = 85x + 50$, and if the rate were raised to $90 per hour, the function would become $y = 90x + 50$. On the other hand, an equation of $y = 8,000(1.04)^x$ could model the rising population of a city with 8,000 residents when the annual growth rate is 4%. Your students will examine what would happen to the population over 25 years if the rate were 6% instead of 4% or the effect on the equation and function of the city’s population were 12,000 instead of 8,000.
Graphs and tables should be used to examine the behaviors of functions as parameters are changed, including the comparison of two functions such as what would happen to a population if it grew by 500 people per year, versus rising an average of 8% per year over the course of 10 years.

**SAMPLE PROBLEM(s):**

1. Determine an exponential function of the form \( f(x) = ab^x \) using data points from the table. Graph the function and identify the key characteristics of the graph.

<table>
<thead>
<tr>
<th>( x )</th>
<th>( f(x) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>27</td>
</tr>
</tbody>
</table>

**Commentary**

We have often seen algebraically defined functions used to model relationships between variables. These functions are often called models. Often we have data points that don't quite all lie on one line but on an exponential curve. The exponential regression option finds the equation of an exponential equation of the form \( y = ab^x \) that best fits a set of data. The values of \( y \) must be greater than zero.

**Solution**

Therefore, the best-fit exponential equation for this data is approximately \( y = 1(3)^x \). The TI-83 calculates the correlation coefficient, \( r \). In this case, \( r \) is 1. The value of \( r \) lies between -1 and 1, inclusive. It is a measure of how well the regression equation fits the data. A value of -1 or 1 indicates a perfect fit. It also calculates the value of the coefficient of determination, \( r^2 \).

a.) Determine an exponential regression model equation to represent this data.
b.) Graph the new equation.
c.) Decide whether the new equation is a "good fit" to represent this data.

2. Sara’s starting salary is $32,500. Each year she receives a $700 raise. Write a sequence in explicit form to describe the situation.

**Commentary**

Functions can be defined explicitly, by a formula in terms of the variable.

**Solution**

The answer below is representing the problem above with a yearly raise of $750. Change the number above to $750. The explicit formula is \( f(x) = 32500 + 750x \), where her annual salary is a function of the number of years she works. Substituting the number of years \( x \), starting with 1, the sequence is 33250, 34000, 34750, 35500, 36250, 37000...

3. Annie is picking apples with her sister. The number of apples in her basket is described by \( n = 22t + 12 \), where \( t \) is the number of minutes Annie spends picking apples. What do the numbers 22 and 12 tell you about Annie’s apple picking? (LE5)

**Commentary**

A practical application of slope, \( m \), is a rate. A rate describes how much one variable changes with respect to another. Rates are often used to describe relationships between time and an action. This equation is called the slope-intercept form for a line. The changes occur as a function of time. The slope is \( m \) and the y-intercept is \( b \). The point where the graph crosses the y-axis is called the y-intercept. The y-intercept represents an initial condition, or what action is occurring when the time is zero.

**Solution**

This linear function \( n = 22t + 12 \), is written in the general form \( y = mx + b \). The slope of the line is \( m \). In the formula, 22 is the slope and represents the number of apples Annie picks in 1 minute. In the formula, 12 represents the initial amount of apples in the basket. As she adds 22 apples to the basket each minute, that amount is automatically increased by the 12 apples in the basket before she began.
<table>
<thead>
<tr>
<th>Virtual Resources: Linear &amp; Exponential Models</th>
</tr>
</thead>
<tbody>
<tr>
<td>• <a href="http://lbstatic-001.tenmarks.com/static/albums/Exponential-Functions/Linear-Quadratic-and-Exponential-Models.html">http://lbstatic-001.tenmarks.com/static/albums/Exponential-Functions/Linear-Quadratic-and-Exponential-Models.html</a></td>
</tr>
<tr>
<td>• <a href="http://lbstatic-001.tenmarks.com/static/albums/Exponential-Functions/Linear-Quadratic-and-Exponential-Models-video-lesson.html">http://lbstatic-001.tenmarks.com/static/albums/Exponential-Functions/Linear-Quadratic-and-Exponential-Models-video-lesson.html</a></td>
</tr>
<tr>
<td>• <a href="http://members.optusnet.com.au/exponentialist/Linear_Vs_Exponential.htm">http://members.optusnet.com.au/exponentialist/Linear_Vs_Exponential.htm</a></td>
</tr>
<tr>
<td>• <a href="http://www.khanacademy.org/math/algebra/ck12-algebra-1/v/linear--quadratic--and-exponential-models">http://www.khanacademy.org/math/algebra/ck12-algebra-1/v/linear--quadratic--and-exponential-models</a></td>
</tr>
</tbody>
</table>