

Learning Targets

Introduction to Exponential Functions

Lesson 1: Growing and Growing

- I can compare growth patterns using calculations and graphs.

Lesson 2: Patterns of Growth

- I can use words and expressions to describe patterns in tables of values.
- When I have descriptions of linear and exponential relationships, I can write expressions and create tables of values to represent them.

Lesson 3: Representing Exponential Growth

- I can explain the connections between an equation and a graph that represents exponential growth.
- I can write and interpret an equation that represents exponential growth.

Lesson 4: Understanding Decay

- I can use only multiplication to represent "decreasing a quantity by a fraction of itself."
- I can write an expression or equation to represent a quantity that decays exponentially.
- I know the meanings of "exponential growth" and "exponential decay."

Lesson 5: Representing Exponential Decay

- I can explain the meanings of a and b in an equation that represents exponential decay and is written as $y = a \cdot b^x$.
- I can find a growth factor from a graph and write an equation to represent exponential decay.
- I can graph equations that represent quantities that change by a growth factor between 0 and 1.

Lesson 6: Analyzing Graphs

- I can use graphs to compare and contrast situations that involve exponential decay.
- I can use information from a graph to write an equation that represents exponential decay.

Lesson 7: Using Negative Exponents

- I can describe the meaning of a negative exponent in equations that represent exponential decay.
- I can write and graph an equation that represents exponential decay to solve problems.

Lesson 8: Exponential Situations as Functions

- I can use function notation to write equations that represent exponential relationships.
- When I see relationships in descriptions, tables, equations, or graphs, I can determine whether the relationships are functions.

Lesson 9: Interpreting Exponential Functions

- I can analyze a situation and determine whether it makes sense to connect the points on the graph that represents the situation.
- When I see a graph of an exponential function, I can make sense of and describe the relationship using function notation.

Lesson 10: Looking at Rates of Change

- I can calculate the average rate of change of a function over a specified period of time.
- I know how the average rate of change of an exponential function differs from that of a linear function.

Lesson 11: Modeling Exponential Behavior

- I can use exponential functions to model situations that involve exponential growth or decay.
- When given data, I can determine an appropriate model for the situation described by the data.

Lesson 12: Reasoning about Exponential Graphs (Part 1)

- I can describe the effect of changing a and b on a graph that represents $f(x) = a \cdot b^x$.
- I can use equations and graphs to compare exponential functions.

Lesson 13: Reasoning about Exponential Graphs (Part 2)

- I can explain the meaning of the intersection of the graphs of two functions in terms of the situations they represent.
- When I know two points on a graph of an exponential function, I can write an equation for the function.

Lesson 14: Recalling Percent Change

- I can find the result of applying a percent increase or decrease on a quantity.
- I can write different expressions to represent a starting amount and a percent increase or decrease.

Lesson 15: Functions Involving Percent Change

- I can use graphs to illustrate and compare different percent increases.
- I can write a numerical expression or an algebraic expression to represent the result of applying a percent increase repeatedly.

Lesson 16: Compounding Interest

- I can explain why applying a percent increase, p , n times is like or unlike applying the percent increase np .

Lesson 17: Different Compounding Intervals

- I can calculate interest when I know the starting balance, interest rate, and compounding intervals.
- When given interest rates and compounding intervals, I can choose the better investment option.

Lesson 18: Expressed in Different Ways

- I can solve problems using exponential expressions written in different ways.
- I can write equivalent expressions to represent situations that involve repeated percent increase or decrease.

Lesson 19: Which One Changes Faster?

- I can use tables, calculations, and graphs to compare growth rates of linear and exponential functions and predict how the quantities change eventually.

Lesson 20: Changes over Equal Intervals

- I can calculate rates of change of functions given graphs, equations, or tables.
- I can use rates of change to describe how a linear function and an exponential function change over equal intervals.

Lesson 21: Predicting Populations

- I can determine how well a chosen model fits the given information.
- I can determine whether to use a linear function or an exponential function to model real-world data.