

Exponential Functions Worksheet Answer Key PDF

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Part 1: Building a Foundation

What is the general form of an exponential function?

undefined. A) $f(x) = ax + b$

undefined. B) $f(x) = a * b^x$ ✓

undefined. C) $f(x) = a^x + b$

undefined. D) $f(x) = a * x^b$

The general form of an exponential function is represented as $f(x) = a * b^x$.

Which of the following are characteristics of exponential growth functions?

undefined. A) The base b is greater than 1. ✓

undefined. B) The graph decreases as x increases.

undefined. C) The graph has a horizontal asymptote at $y = 0$. ✓

undefined. D) The y-intercept is at $(0, a)$. ✓

Exponential growth functions have a base greater than 1, a horizontal asymptote at $y = 0$, and a y-intercept at $(0, a)$.

Explain why the base b of an exponential function cannot be 1.

If the base b is 1, the function would not change with x, resulting in a constant function rather than an exponential function.

List the components of the exponential function $f(x) = a * b^x$.

1. What is the coefficient?

a

2. What is the base?

b

3. What is the exponent?

x

The components include the coefficient a, the base b, and the exponent x.

Part 2: Understanding and Interpretation

What happens to the graph of an exponential function when the base b is between 0 and 1?

undefined. A) It represents exponential growth.

undefined. B) It becomes a linear function.

undefined. C) It represents exponential decay. ✓

undefined. D) It remains constant.

When the base b is between 0 and 1, the graph represents exponential decay.

Which transformations affect the graph of an exponential function $f(x) = a \cdot b^x$?**undefined. A) Vertical shift ✓****undefined. B) Horizontal shift ✓****undefined. C) Reflection over the x-axis ✓**

undefined. D) Rotation around the origin

Transformations include vertical shifts, horizontal shifts, and reflections over the x-axis.

Describe how the graph of $f(x) = 2 \cdot 3^x$ changes if it is transformed to $f(x) = 2 \cdot 3^{x-2} + 1$.**The graph shifts 2 units to the right and 1 unit up, affecting the position of the horizontal asymptote.**

Part 3: Application and Analysis

If a population of bacteria doubles every hour, which function models this growth?**undefined. A) $f(x) = 100 \cdot 2^x$ ✓**

undefined. B) $f(x) = 100 * x^2$

undefined. C) $f(x) = 100 * 0.5^x$

undefined. D) $f(x) = 100 * x$

The function that models this growth is $f(x) = 100 * 2^x$, where x represents hours.

In finance, which scenarios can be modeled using exponential functions?

undefined. A) Simple interest

undefined. B) Compound interest ✓

undefined. C) Loan amortization ✓

undefined. D) Depreciation of assets ✓

Scenarios such as compound interest and depreciation of assets can be modeled using exponential functions.

A certain radioactive substance decays at a rate of 5% per year. Write the exponential decay function representing this scenario.

The exponential decay function can be written as $f(t) = a * (0.95)^t$, where a is the initial amount.

Which of the following statements about the function $f(x) = 3 * (0.5)^x$ is true?

undefined. A) It represents exponential growth.

undefined. B) It has a y-intercept at (0, 3). ✓

undefined. C) It has a horizontal asymptote at $y = 3$.

undefined. D) It increases as x increases.

The function represents exponential decay and has a y-intercept at (0, 3).

Part 4: Evaluation and Creation

Which function best models a scenario where a car's value decreases by 20% each year?

undefined. A) $f(x) = 20000 * 0.8^x$ ✓

undefined. B) $f(x) = 20000 * 1.2^x$

undefined. C) $f(x) = 20000 * 0.2^x$

undefined. D) $f(x) = 20000 * x^{0.8}$

The function that best models this scenario is $f(x) = 20000 * 0.8^x$.

You are designing a model for predicting the spread of a virus. Which factors should be considered in your exponential function model?

undefined. **A) Initial number of cases** ✓

undefined. **B) Rate of transmission** ✓

undefined. **C) Population density** ✓

undefined. D) Recovery rate

Factors to consider include the initial number of cases, rate of transmission, and population density.

Create an exponential function to model a scenario where a new technology's adoption rate is expected to triple every year. Explain your reasoning.

An example function could be $f(t) = a * 3^t$, where a is the initial adoption rate.