Graphing Exponentials Worksheet

Graphing Exponentials Worksheet

Disclaimer: *The graphing exponentials worksheet was generated with the help of StudyBlaze AI. Please be aware that AI can make mistakes. Please consult your teacher if you're unsure about your solution or think there might have been a mistake. Or reach out directly to the StudyBlaze team at max@studyblaze.io.*

Part 1: Building a Foundation

What is the standard form of an exponential function?

Hint: Consider the general formula for exponential functions.

- ◯ A) f(x) = mx + b
- ◯ B) f(x) = a * b^x
- ◯ C) f(x) = ax^2 + bx + c
- ◯ D) f(x) = 1/x

What is the standard form of an exponential function?

Hint: Consider the general formula for exponential functions.

- ◯ A) f(x) = mx + b
- ◯ B) f(x) = a * b^x
- ◯ C) f(x) = ax^2 + bx + c
- ◯ D) f(x) = 1/x

Which of the following are characteristics of exponential growth?

Hint: Think about the behavior of the graph as x increases.

- ☐ A) The graph is a straight line.
- ☐ B) The graph increases rapidly.
- ☐ C) The base b is greater than 1.
- ☐ D) The graph has a horizontal asymptote.

Which of the following are characteristics of exponential growth?

Hint: Think about the behavior of the graph as x increases.

- ☐ A) The graph is a straight line.

- [ ] B) The graph increases rapidly.
- [ ] C) The base b is greater than 1.
- [ ] D) The graph has a horizontal asymptote.

Explain what happens to the graph of an exponential function when the base b is between 0 and 1.

Hint: Consider the direction of the graph as x increases.

Explain what happens to the graph of an exponential function when the base b is between 0 and 1.

Hint: Consider the direction of the graph as x increases.

What is the y-intercept of the exponential function f(x) = 3 * 2^x?

Hint: Evaluate the function at x = 0.

- ◯ A) 0
- ◯ B) 1
- ◯ C) 2
- ◯ D) 3

What is the y-intercept of the exponential function f(x) = 3 * 2^x?

Hint: Evaluate the function at x = 0.

- ◯ A) 0
- ◯ B) 1
- ◯ C) 2

◯ D) 3

Part 2: Understanding and Application

If an exponential function represents decay, which of the following must be true about the base b?

Hint: Consider the properties of exponential functions.

◯ A) $b > 1$
◯ B) $b = 1$
◯ C) $0 < b < 1$
◯ D) $b < 0$

If an exponential function represents decay, which of the following must be true about the base b?

Hint: Consider the properties of exponential decay.

◯ A) $b > 1$
◯ B) $b = 1$
◯ C) $0 < b < 1$
◯ D) $b < 0$

Which of the following statements about exponential functions are true?

Hint: Think about the applications and properties of exponential functions.

☐ A) They can model population growth.
☐ B) They always pass through the origin.
☐ C) They have a constant rate of change.
☐ D) They can model radioactive decay.

Which of the following statements about exponential functions are true?

Hint: Think about the applications and properties of these functions.

☐ A) They can model population growth.
☐ B) They always pass through the origin.
☐ C) They have a constant rate of change.
☐ D) They can model radioactive decay.

Describe how the graph of f(x) = 2 * 3^x + 4 differs from the graph of f(x) = 2 * 3^x.

Hint: Consider the vertical shift introduced by the constant.

Describe how the graph of f(x) = 2 * 3^x + 4 differs from the graph of f(x) = 2 * 3^x.

Hint: Consider the vertical shift caused by the constant.

Which of the following functions represents exponential decay?

Hint: Look for a base that is less than 1.

- ◯ A) f(x) = 5 * 1.5^x
- ◯ B) f(x) = 3 * 0.8^x
- ◯ C) f(x) = 2 * 2^x
- ◯ D) f(x) = 4 * x^2

Which of the following functions represents exponential decay?

Hint: Look for a base that is less than 1.

- ◯ A) f(x) = 5 * 1.5^x
- ◯ B) f(x) = 3 * 0.8^x
- ◯ C) f(x) = 2 * 2^x
- ◯ D) f(x) = 4 * x^2

A population of bacteria doubles every 3 hours. If the initial population is 100, write the exponential function that models this situation.

Hint: Use the formula for exponential growth.

A population of bacteria doubles every 3 hours. If the initial population is 100, write the exponential function that models this situation.

Hint: Use the formula for exponential growth.

Part 3: Analysis, Evaluation, and Creation

Analyze the function f(x) = -3 * 2^x. Which of the following are true?

Hint: Consider the effects of the negative coefficient.

- [ ] A) The graph is reflected over the x-axis.
- [ ] B) The graph represents exponential decay.
- [ ] C) The graph has a horizontal asymptote at y = 0.
- [ ] D) The y-intercept is -3.

Analyze the function f(x) = -3 * 2^x. Which of the following are true?

Hint: Consider the effects of the negative coefficient.

- [ ] A) The graph is reflected over the x-axis.
- [ ] B) The graph represents exponential decay.
- [ ] C) The graph has a horizontal asymptote at y = 0.
- [ ] D) The y-intercept is -3.

Compare and contrast the graphs of f(x) = 2^x and g(x) = 2^{-x}.

Hint: Think about the direction and behavior of each graph.

Compare and contrast the graphs of f(x) = 2^x and g(x) = 2^{-x}.

Hint: Think about the direction and behavior of each graph.

What is the effect of changing the base b from 2 to 0.5 in the function f(x) = 3 * b^x?

Hint: Consider how the graph's direction changes.

- ◯ A) The graph becomes steeper.
- ◯ B) The graph changes from growth to decay.
- ◯ C) The graph remains unchanged.
- ◯ D) The graph shifts horizontally.

What is the effect of changing the base b from 2 to 0.5 in the function f(x) = 3 * b^x?

Hint: Consider how the graph's direction changes.

- ◯ A) The graph becomes steeper.
- ◯ B) The graph changes from growth to decay.
- ◯ C) The graph remains unchanged.
- ◯ D) The graph shifts horizontally.

Evaluate the effectiveness of using exponential functions to model the spread of a virus. Discuss the assumptions and limitations of this model.

Hint: Consider the factors that influence virus spread.

Evaluate the effectiveness of using exponential functions to model the spread of a virus. Discuss the assumptions and limitations of this model.

Hint: Consider the factors that influence virus spread.

Which scenario is best modeled by an exponential function?

Hint: Think about growth and decay processes.

- ◯ A) A car traveling at a constant speed.
- ◯ B) The temperature of a cooling object.
- ◯ C) The height of a thrown ball over time.
- ◯ D) The distance traveled by a train.

Which scenario is best modeled by an exponential function?

Hint: Consider the nature of the change over time.

- ◯ A) A car traveling at a constant speed.
- ◯ B) The temperature of a cooling object.
- ◯ C) The height of a thrown ball over time.
- ◯ D) The distance traveled by a train.