Graphing Absolute Value Functions Worksheet

Graphing Absolute Value Functions Worksheet

Disclaimer: *The graphing absolute value functions 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 general shape of the graph of an absolute value function?

Hint: Think about the basic geometric shape that represents absolute value.

- ◯ A) Linear
- ◯ B) Parabolic
- ◯ C) V-shaped
- ◯ D) Circular

Which of the following are characteristics of the graph of an absolute value function?

Hint: Consider the properties that define the graph's appearance.

- ☐ A) It has a vertex.
- ☐ B) It is symmetric about the y-axis.
- ☐ C) It is always increasing.
- ☐ D) It is V-shaped.

Explain what the vertex of an absolute value function represents in the context of its graph.

Hint: Think about the point where the graph changes direction.

List the parameters in the vertex form of an absolute value function f(x) = a|x - h| + k and describe their roles.

Hint: Consider how each parameter affects the graph's position and shape.

1. a:

2. h:

3. k:

Part 2: comprehension and Application

If the vertex form of an absolute value function is f(x) = 2|x + 3| - 4, what is the vertex of the graph?

Hint: Identify the values of h and k in the vertex form.

- ◯ A) (-3, -4)
- ◯ B) (3, 4)
- ◯ C) (-3, 4)
- ◯ D) (3, -4)

How does the graph of f(x) = -|x| differ from the graph of f(x) = |x|?

Hint: Consider the effects of the negative sign on the graph.

- ☐ A) It is shifted downwards.
- ☐ B) It is reflected across the x-axis.
- ☐ C) It is wider.
- ☐ D) It is narrower.

Graph the function f(x) = -\frac{1}{2}|x - 4| + 2 and describe the transformations applied to the parent function f(x) = |x|.

Hint: Consider the effects of the coefficients and constants on the graph.

Which transformations are applied to the graph of f(x) = |x| to obtain f(x) = 2|x + 1| - 3?

Hint: Think about how each parameter affects the graph's position and shape.

- [ ] A) Vertical stretch by a factor of 2
- [ ] B) Horizontal shift left by 1 unit
- [ ] C) Vertical shift down by 3 units
- [ ] D) Reflection across the x-axis

Part 3: Analysis, Evaluation, and Creation

If the graph of an absolute value function opens downwards and has a vertex at (2, -3), which of the following could be its equation?

Hint: Consider the implications of the vertex's position and the direction of opening.

- ◯ A) f(x) = -|x - 2| - 3
- ◯ B) f(x) = -|x - 2| + 3
- ◯ C) f(x) = |x - 2| - 3
- ◯ D) f(x) = -|x + 2| - 3

Analyze the function f(x) = -3|x + 2| + 5. Which of the following statements are true?

Hint: Consider the effects of the coefficients and constants on the graph.

- [ ] A) The graph is reflected across the x-axis.
- [ ] B) The vertex is at (-2, 5).
- [ ] C) The graph is compressed vertically.
- [ ] D) The graph is shifted 5 units up.

Compare and contrast the graphs of f(x) = |x| and g(x) = |x - 4| + 2. Discuss the transformations involved.

Hint: Think about how the transformations affect the position and shape of the graphs.

Which of the following functions represents a graph that is both vertically stretched and shifted downwards?

Hint: Consider the effects of the coefficients and constants on the graph.

- ◯ A) f(x) = 2|x| + 3
- ◯ B) f(x) = \frac{1}{2}|x| - 4
- ◯ C) f(x) = 3|x| - 2
- ◯ D) f(x) = -2|x| + 1

Design a function that has a vertex at (1, -2) and opens upwards. Which of the following could be correct?

Hint: Consider the implications of the vertex's position and the direction of opening.

- ☐ A) f(x) = |x - 1| - 2
- ☐ B) f(x) = 2|x - 1| - 2
- ☐ C) f(x) = -|x - 1| + 2
- ☐ D) f(x) = \frac{1}{2}|x - 1| - 2

Create an absolute value function that has a vertex at (-3, 4), opens downwards, and is vertically compressed. Provide the equation and describe the transformations applied.

Hint: Think about how to structure the equation to meet the criteria.