

Graphing A Quadratic Function Worksheet Answer Key PDF

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Part 1: Building a Foundation

Which of the following is the standard form of a quadratic function?

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

undefined. B) $f(x) = ax^2 + bx + c$ ✓

undefined. C) $f(x) = a(x-h)^2 + k$

undefined. D) $f(x) = ax^3 + bx^2 + cx + d$

The standard form of a quadratic function is given by option B.

Identify the correct statements about the graph of a quadratic function.

undefined. A) It is always a straight line.

undefined. B) It is a parabola. ✓

undefined. C) It can open upwards or downwards. ✓

undefined. D) It always has a vertex. ✓

The correct statements are B, C, and D.

Explain what the vertex of a parabola represents in the context of a quadratic function.

The vertex represents the maximum or minimum point of the quadratic function.

List the key features of a parabola that are essential for graphING a quadratic function.

1. What is the vertex?

The vertex is the highest or lowest point of the parabola.

2. What is the axis of symmetry?

The axis of symmetry is a vertical line that divides the parabola into two mirror images.

3. What are the x-intercepts?

The x-intercepts are the points where the parabola crosses the x-axis.

Key features include the vertex, axis of symmetry, x-intercepts, and y-intercept.

Part 2: comprehension and Application

If the quadratic function $f(x) = 2x^2 - 4x + 1$ is graphed, what is the direction of the parabola?

undefined. A) Upwards ✓

undefined. B) Downwards

undefined. C) Left

undefined. D) Right

The parabola opens upwards because the coefficient of x^2 is positive.

Which of the following transformations affect the width of a parabola?

undefined. A) Changing the value of a ✓

undefined. B) Changing the value of b

undefined. C) Changing the value of c

undefined. D) ReflectING over the x-axis

Changing the value of a affects the width of the parabola.

Graph the quadratic function $f(x) = x^2 - 6x + 8$ and identify the x-intercepts.

The x-intercepts can be found by factoring the quadratic or using the quadratic formula.

Given the quadratic function $f(x) = (x-3)^2 + 2$, what is the vertex of the parabola?

undefined. A) (3, 2) ✓

undefined. B) (-3, 2)

undefined. C) (2, 3)

undefined. D) (0, 2)

The vertex of the parabola is at (3, 2).

Part 3: Analysis, Evaluation, and Creation

Which of the following equations represents a parabola that opens downwards and has a vertex at (1, -2)?

undefined. A) $f(x) = -(x-1)^2 - 2$ ✓

undefined. B) $f(x) = (x+1)^2 + 2$

undefined. C) $f(x) = -(x+1)^2 + 2$

undefined. D) $f(x) = (x-1)^2 - 2$

The correct equation is A, which opens downwards.

Analyze the quadratic function $f(x) = 3x^2 - 12x + 9$. Which of the following are true?

undefined. A) The vertex is at (2, -3).

undefined. B) The axis of symmetry is $x = 2$. ✓

undefined. C) The parabola opens upwards. ✓

undefined. D) The y-intercept is 9.

The true statements are B and C.

Explain how to determine the axis of symmetry for the quadratic function $f(x) = ax^2 + bx + c$.

The axis of symmetry can be found using the formula $x = -b / (2a)$.

Which quadratic function best models a scenario where a ball is thrown upwards, reaches a maximum height, and then falls back to the ground?

undefined. A) $f(x) = -2x^2 + 8x + 5$ ✓

undefined. B) $f(x) = 2x^2 - 8x + 5$

undefined. C) $f(x) = x^2 + 8x + 5$

undefined. D) $f(x) = -x^2 - 8x + 5$

The correct function is A, which opens downwards.

Create a quadratic function with a vertex at (4, -1) and that opens upwards. Which of the following could be the function?

undefined. A) $f(x) = (x-4)^2 - 1$ ✓

undefined. B) $f(x) = 2(x-4)^2 - 1$ ✓

undefined. C) $f(x) = -2(x-4)^2 + 1$

undefined. D) $f(x) = (x+4)^2 + 1$

The correct options are A and B, which both have the vertex at (4, -1) and open upwards.

Design a real-world problem that can be modeled by a quadratic function, and explain how you would solve it using the graph of the function.

An example could be modeling the height of a ball over time and using the graph to find the maximum height.