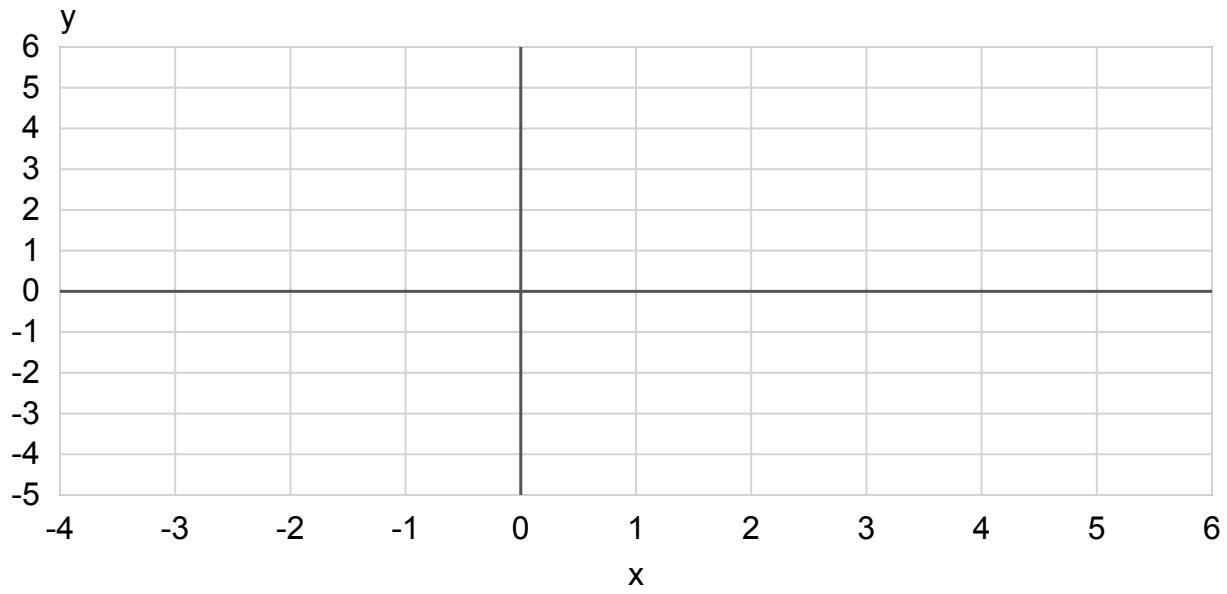
Graph Two Function Families

Graph a quadratic and an absolute-value function and identify key features

Name: _____ Date: _____

Part 1 - Quadratic Function

Selected function family: quadratic. Listen to your teacher's directions before beginning. By hand, graph y = (x - 1)^2 - 4. Plot enough points to show the curve clearly. Label the vertex and every intercept on the graph. Then use graphing technology to check one feature; do not replace your hand graph.



Key feature	Coordinate, equation, or description
Vertex	
Axis of symmetry	
x-intercept(s)	
y-intercept	
Minimum or maximum	
Technology check: one matching feature	

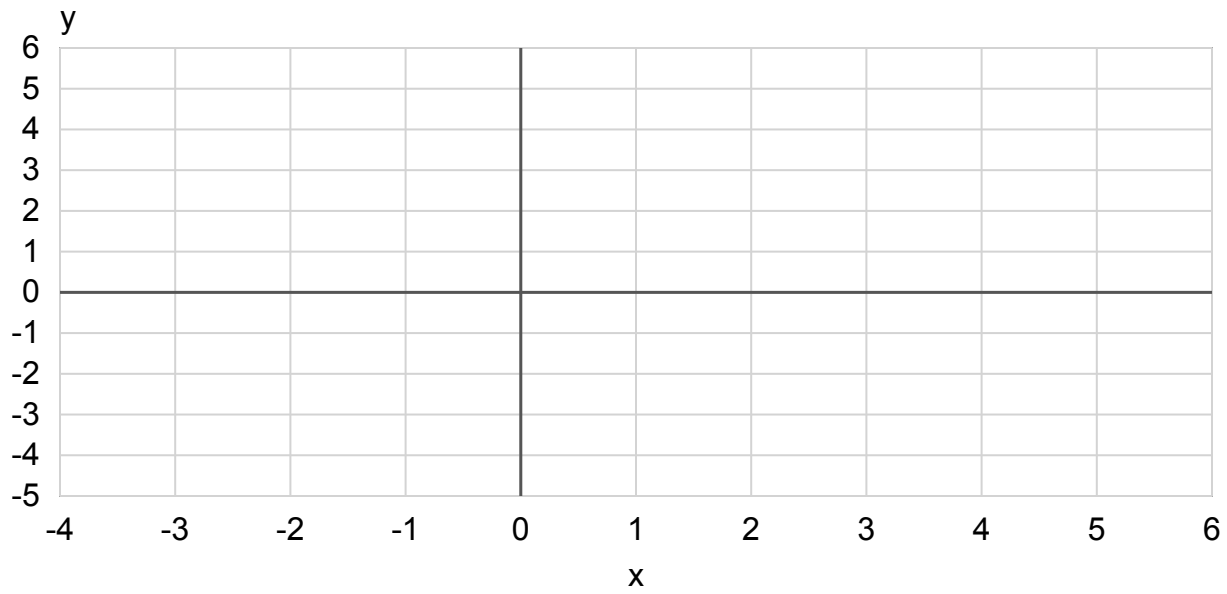
Graph Two Function Families

Graph a quadratic and an absolute-value function and identify key features

Name: _____ Date: _____

Part 2 - Absolute-Value Function

Selected function family: absolute value. By hand, graph y = -2|x + 1| + 4. Plot enough points to show both straight sides clearly. Label the vertex and every intercept on the graph. Then use graphing technology to check one feature; do not replace your hand graph.



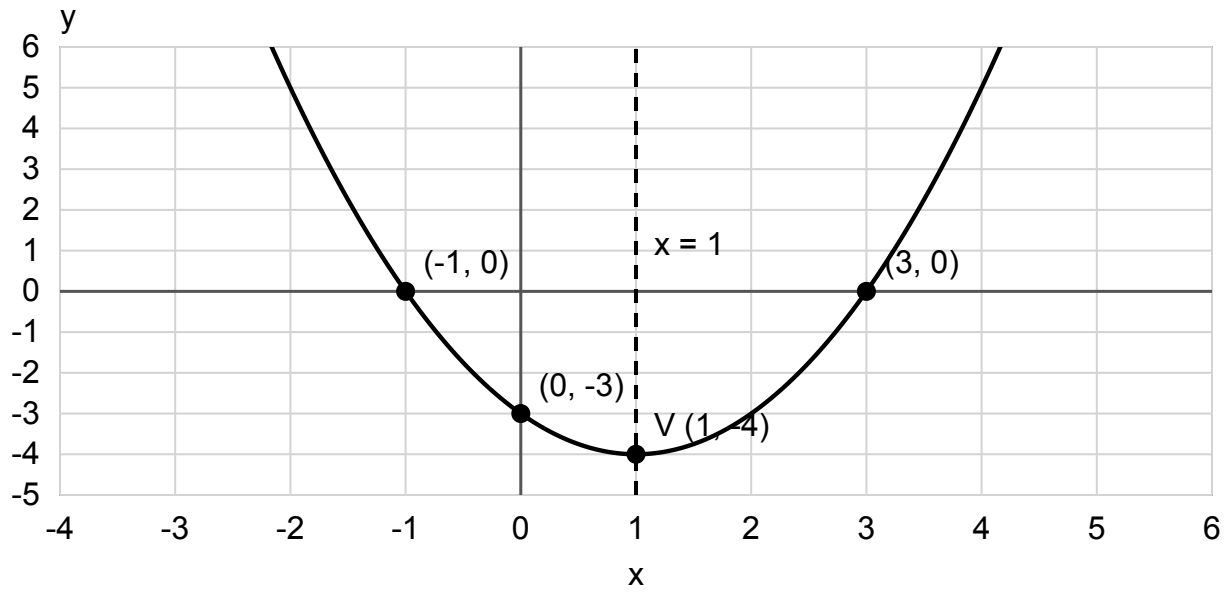
Key feature	Coordinate, equation, or description
Vertex	
Axis of symmetry	
x-intercept(s)	
y-intercept	
Minimum or maximum	
Technology check: one matching feature	

Graph Two Function Families

Graph a quadratic and an absolute-value function and identify key features

Answer Key and Teaching Notes - Part 1

1. Quadratic answers. y = (x - 1)^2 - 4 has vertex (1, -4), axis of symmetry x = 1, x-intercepts (-1, 0) and (3, 0), y-intercept (0, -3), and minimum value -4. Reasoning: (x - 1)^2 - 4 = 0 gives (x - 1)^2 = 4, so x = -1 or 3. The coefficient of the squared expression is positive, so the parabola opens upward.



2. Technology-check response. Accept any accurate matching feature, such as “The graphing tool also shows vertex (1, -4)” or “The tool shows zeros at x = -1 and x = 3.”

Exact setup and materials. Print the two student pages one-sided. Give each student a pencil, ruler, and both pages. Provide one graphing calculator or graphing-capable device per pair for the final check only. Supplied materials: two blank coordinate grids and feature tables. Additional materials: pencils, rulers, and devices. Tell students to complete the hand graph before opening a graphing tool.

Teaching script. Read: “First make your own graph from the equation. Mark the vertex and intercepts. After your hand graph is complete, use technology only to check one feature. If the screen and your graph disagree, use the equation to investigate.”

Observation method. Circulate while devices are closed. Look for a plotted vertex, both intercepts, a smooth U-shaped curve, and a vertical symmetry line at x = 1. During the check, ask: “What equation did you set equal to zero to locate an x-intercept?” Record whether the student used the equation and whether the technology statement names a matching feature.

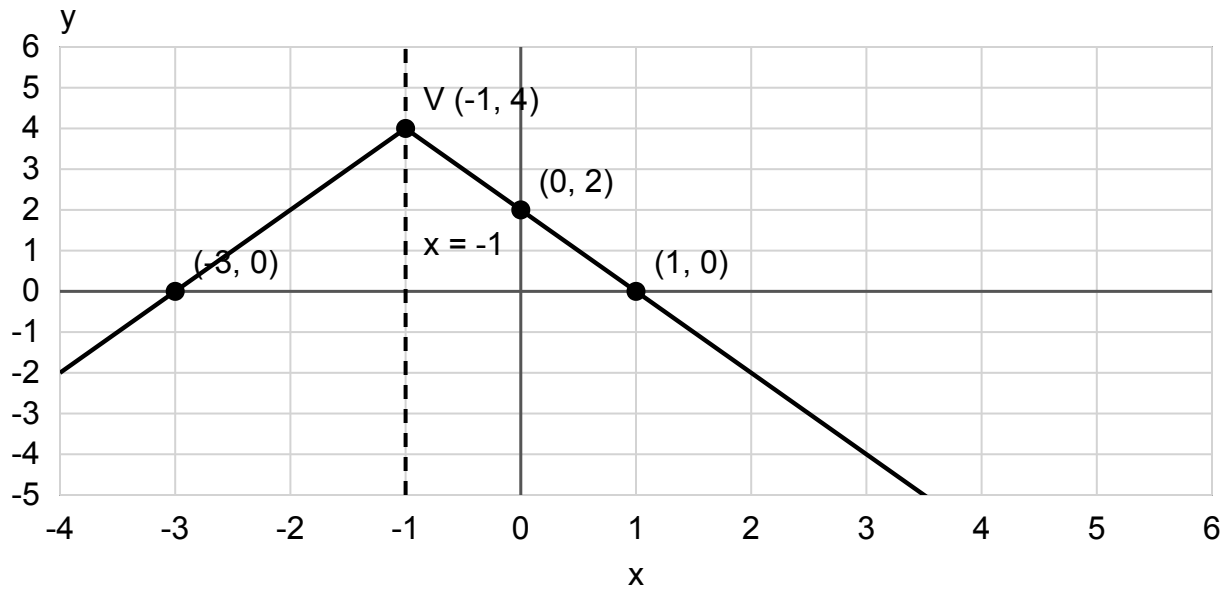
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Graph Two Function Families

Graph a quadratic and an absolute-value function and identify key features

Answer Key and Teaching Notes - Part 2

3. Absolute-value answers. y = -2|x + 1| + 4 has vertex (or maximum) (-1, 4), axis of symmetry x = -1, x-intercepts (-3, 0) and (1, 0), and y-intercept (0, 2). Its maximum value is 4. Reasoning: -2|x + 1| + 4 = 0 gives |x + 1| = 2, so x = -3 or 1. The negative coefficient makes the V open downward.



4. Technology-check response. Accept any accurate matching feature, such as “The tool confirms the maximum is 4” or “The tool shows a y-intercept of (0, 2).”

Observation method and feedback. Look for two straight rays meeting at (-1, 4), symmetry across x = -1, and intercepts at x = -3 and x = 1. If a student reverses the opening, ask: “What does the negative sign in front of 2 do to the parent graph y = |x|?” If a student has only one x-intercept, ask them to solve |x + 1| = 2 using both possible values.

Quick scoring guide. For each part: 2 points for an accurately shaped, scaled graph; 2 points for correctly labeled vertex and intercepts; 1 point for the axis and extremum; 1 point for a valid technology check. A graph may include extra accurate points.

Source credit. New York State Next Generation Mathematics task reference, AI-F.IF.7: https://lessonmakerpro.com/standards/ny-nextgen-math/ai-f-if-7