lead4ward

Quadratic Functions

Sample Transitional Items ▶

Subcluster	Learning from Mistakes Students may make the following mistakes:	Interesting Items ▶
Writing and Solving Quadratic Equations Readiness: A.8(A) Supporting: A.6(B), A.6(C), A.7(B), A.8(B)	• difficulty identifying equivalent quadratic expressions [$(x+4)^2 = x^2 + 16$ instead of $x^2 + 8x + 16$]* • when factoring, confusing whether pairs of numbers have a common product or common sum • not knowing to set equations equal to 0 before solving • making sign errors when determining solutions from factors* • when evaluating the quadratic formula, making arithmetic mistakes involving integers, squares, square roots, fractions, and/or the order of operations* • when using the quadratic formula, incorrectly simplifying (or forgetting to simplify) the radical expression • having difficulty remembering how to complete the square due to lack of understanding of the process of factoring perfect square trinomials • confusing the signs for h and k (since h follows a minus sign and k follows a plus sign) • in rewriting equations from vertex form to standard form, making errors in squaring the binomial* • making sign errors in writing the factors from the solutions • forgetting the need to determine the value of a as the lead coefficient of the quadratic function • making errors in data entry • confusing the x and y variables, or misinterpreting their meaning in the context	A.8(A) 2021 item 37 A.8(A) 2018 item 41 A.8(A) 2016 item 22 A.8(A) 2016 item 29 A.6(B) 2018 item 26 A.6(B) 2017 item 43 A.6(C) 2018 item 7 A.6(C) 2017 item 10 A.7(B) 2016 item 16 A.8(B) 2021 item 47 A.8(B) 2017 item 39
Describing Quadratic Functions Readiness: A.6(A), A.7(A), A.7(C) Supporting: A.12(A), A.12(B)	• confusing x and y values* • confusing which inequality symbol to use (< or >, ≤ or ≥, etc.) • confusing domain and range of quadratic functions* • having difficulty determining the domain or range for a given table of values* • having difficulty determining how a problem situation can limit the domain or the range • having difficulty representing a graph when given a limited domain/range* • identifying the spread of the quadratic function represented on a graph as the domain instead of the x-intercepts* • confusing x-intercepts and the y-intercept, especially in terms of which of the coordinates is equal to zero* • not considering that a quadratic function can have one or two x-intercepts or no x-intercepts at all • having difficulty determining properties of symmetry • confusing the vertex with the axis of symmetry* • confusing the signs for the values for c and d (positive or negative) and the direction of the translations (up, down, left, or right)* • confusing vertical stretch, vertical compression, horizontal stretch, and horizontal compression and their effects on the graph* • confusing translations (adding/subtracting numbers to the parent function $(f)x$) with stretches/compressions (multiplying of numbers to the parent function)*	A.6(A) 2022 item 47 A.6(A) 2019 item 50 A.6(A) 2018 item 38 A.6(A) 2016 item 12 A.7(A) 2022 item 1 A.7(A) 2019 item 46 A.7(A) 2017 item 46 A.7(C) 2021 item 28 A.7(C) 2019 item 12 A.7(C) 2018 item 48 A.7(C) 2017 item 24 A.7(C) 2016 item 4

Stimulus

Word Problem*	Verbal Description*	Chart/ Table*	Graph*	Equation/ Expression*	Manipulatives	Diagram/ Image	Number Line	Base Ten Blocks	Measurement Tool	Formula	Geometric Figures

Academic Vocabulary

axis of symmetry*	function notation	no real solution*	quadratic function*	take square roots	width*
complete the square	horizontal shift*	parabola*	range*	upward*	x-intercept*
domain*	maximum value*	parent function*	regression	vertex (of a quadratic function)*	y-intercept*
downward*	minimum point*	quadratic equation*	solution	vertex form (of a quadratic function)	zeros*
factor	minimum value*	quadratic formula	standard form (of a quadratic function)	vertical shift*	