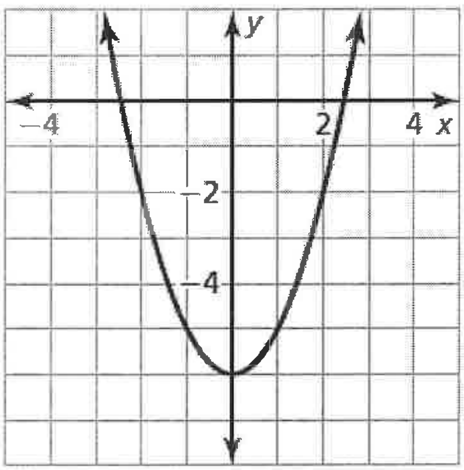
ANSWER PRESENTATION TOOL

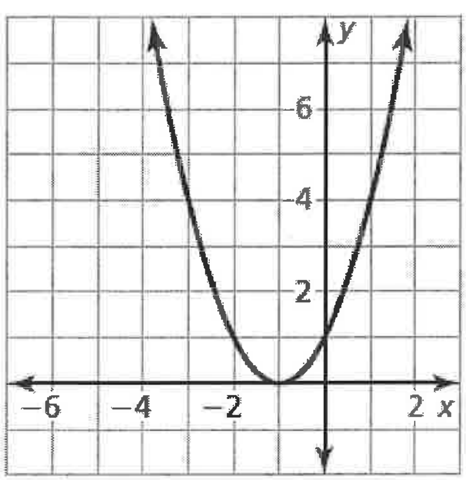
Algebra 2 - Student Edit 2 Practice Tes 1,2,3,4,5,6,8 ALL EVEN Show Solı

ODD

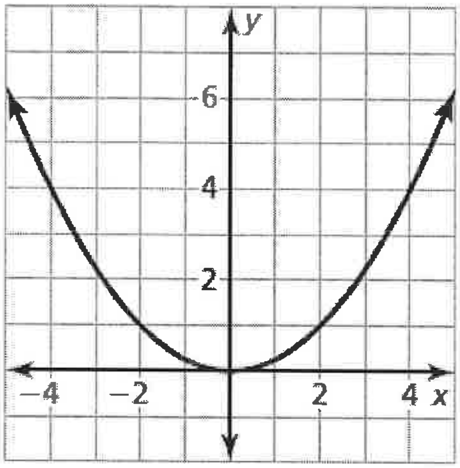
1. The graph of g is a vertical translation 6 units down of the graph of the parent quadratic function.



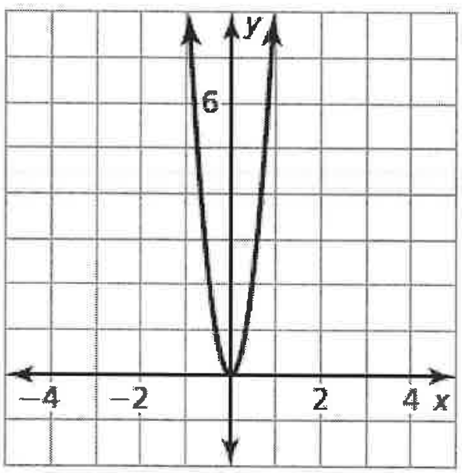
2. The graph of g is a horizontal translation 1 unit left of the graph of the parent quadratic function.



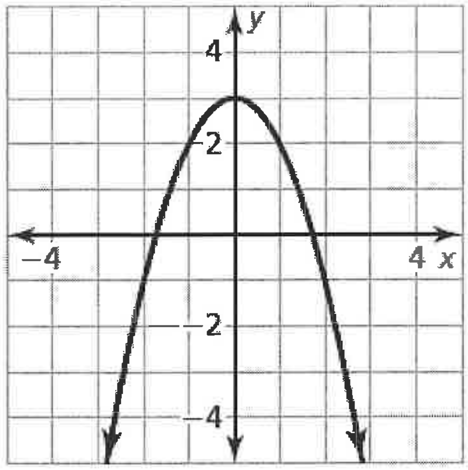
3. The graph of g is a vertical shrink by a factor of $\frac{1}{4}$ of the graph of the parent quadratic function.



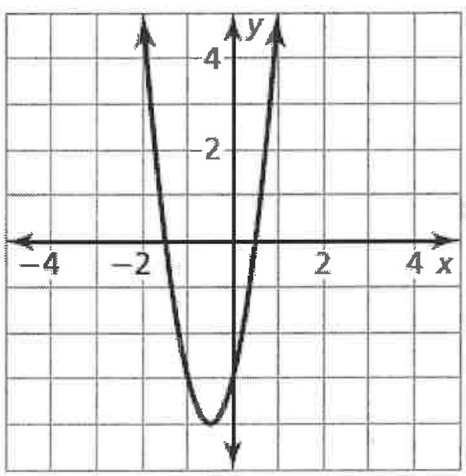
4. The graph of g is a horizontal shrink by a factor of $\frac{1}{3}$ of the graph of the parent quadratic function.



5. The graph of g is a reflection in the x-axis and a vertical translation 3 units up of the graph of the parent quadratic function.



6. The graph of g is horizontal translation 1 unit left, followed by a horizontal shrink by a factor of $\frac{1}{2}$, and a vertical translation 4 units down of the graph of the parent quadratic function.



8. Identify the constants $a = 8$, $b = -4$, and $c = 3$. Because $a > 0$, the parabola opens up. Find the vertex. First calculate the x-coordinate.

$$x = -\frac{b}{2a} = -\frac{-4}{2(8)} = \frac{1}{4}$$

Then find the y-coordinate of the vertex.

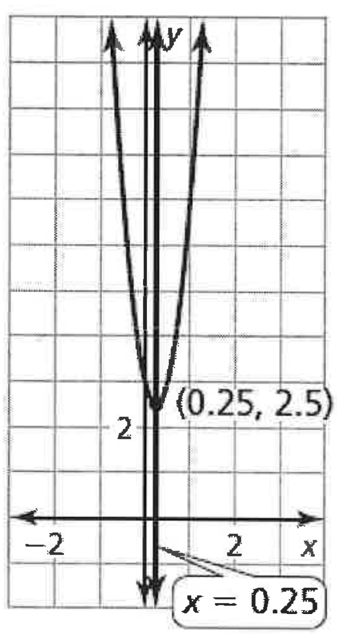
$$f\left(\frac{1}{4}\right) = 8\left(\frac{1}{4}\right)^2 - 4\left(\frac{1}{4}\right) + 3 = 2.5$$

So, the vertex is $\left(\frac{1}{4}, 2.5\right)$. Plot the point. Draw the axis of symmetry $x = \frac{1}{4}$.

Identify the y-intercept c, which is 3. Plot the point (0, 3) and its reflection in the axis of symmetry, $\left(\frac{1}{2}, 3\right)$. Evaluate the function for another value of x, such as $x = 1$.

$$f(1) = 8(1)^2 - 4(1) + 3 = 7$$

Plot the point (1, 7) and its reflection in the axis of symmetry, $\left(-\frac{1}{2}, 7\right)$. Draw a parabola through the plotted points.



The function is decreasing to the left of $x = \frac{1}{4}$ and increasing

The function is decreasing to the left of $x = \frac{1}{4}$ and increasing to the right of $x = \frac{1}{4}$.

11. The parabola has x-intercepts -1 and 7, and passes through the point (5, 3). Use the x-intercepts and the point to solve for a in intercept form.

$y = a(x - p)(x - q)$

$3 = a(5 + 1)(5 - 7)$

$3 = -12a$

$a = -\frac{1}{4}$

So, an equation of the parabola is $y = -\frac{1}{4}(x + 1)(x - 7)$.

13. The profit function for the surfboard shop is $P(x) = (500 - 10x)(40 + x) = 10(50 - x)(40 + x)$, where P is the monthly profit and x is the number of \$10 changes in the price of the surfboards. The x-intercepts of the function are 50 and -40. So, the x-coordinate of the vertex is

$$x = \frac{p + q}{2} = \frac{50 + (-40)}{2} = 5.$$

The y-coordinate of the vertex is

$P(5) = 10(50 - 5)(40 + 5) = 20{,}250.$

When the price of a surfboard is \$450, the profit is \$20,250 per month, which is the maximum profit.

14. The input values are equally spaced. So, analyze the differences in the outputs to determine what type of function you can use to model the data.

$f(2)$		$f(4)$		$f(6)$		$f(8)$		$f(10)$
0		-13		-34		-63		-100
	13		21		29		37	
		8		8		8		

Because the second differences are constant, you can model the data with a quadratic function. Write a quadratic function of the form $f(x) = ax^2 + bx + c$ that models the data. Use any three points $(x, f(x))$ from the table to write a system of equations.

Use $(2, 0)$: $4a + 2b + c = 0$

Use $(4, -13)$: $16a + 4b + c = -13$

Use $(6, -34)$: $36a + 6b + c = -34$

Use the elimination method to solve the system.

$24a + 4b = -26$

$32a + 4b = -34$

$-8a = 8$

$a = -1$

$b = -\frac{1}{2}$

$c = 5$

The data can be modeled by the function

$f(x) = -x^2 - \frac{1}{2}x + 5.$

16. Using technology, a quadratic function is a good model for the data.

$f(x) = -0.03x^2 + 9.2x + 4347$

$f(100) = -0.03(100)^2 + 9.2(100) + 4347 = 4967$

The approximate speed of sound when the water temperature is 100°F is about 4967 feet per second.