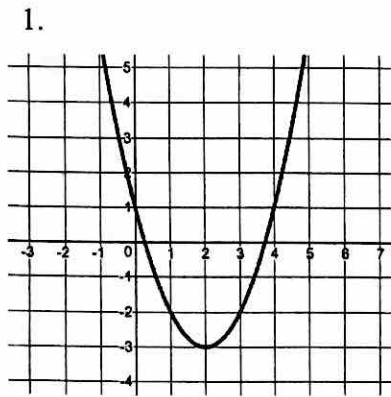
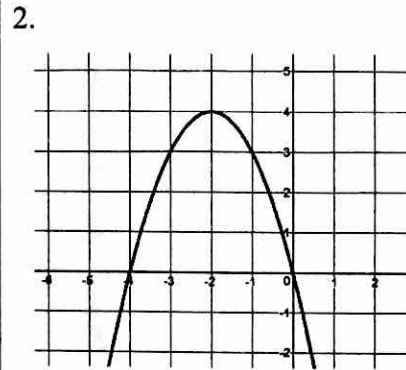


Identify characteristics of the quadratic function and its graph.



Domain:	\mathbb{R}
Range:	$y \geq -3$
Transformation(s):	Translation 2 units R and 3 units down

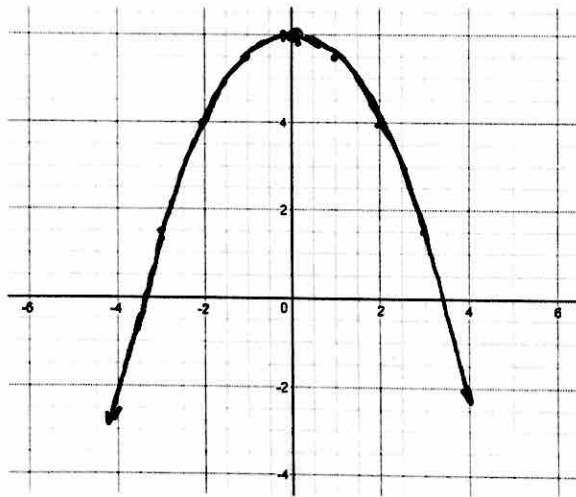


Domain:	\mathbb{R}
Range:	$y \leq 4$
Transformation(s):	Reflection over the x-axis, Translated 2 units left and 4 units up.

Graph the function and compare the graph of the function to the graph of $f(x) = x^2$.

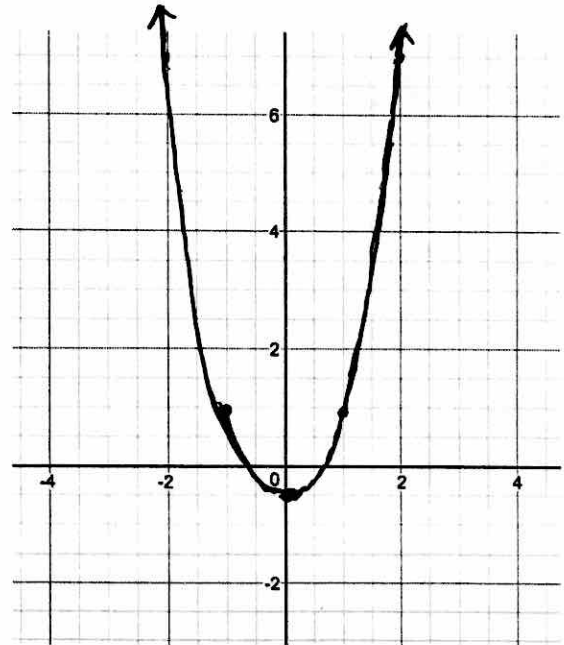
3. $g(x) = -\frac{1}{2}x^2 + 6$

x	-2	-1	0	1	2
g(x)	4	5.5	6	5.5	4



4. $h(x) = 2x^2 - 1$

x	-2	-1	0	1	2
h(x)	7	1	-1	1	7



Describe the domain and range of the function.

5. $f(x) = -x^2 + 4x + 5$

$x = -\frac{b}{2a}$

$a = -1$
 $b = 4$
 $x = -\frac{4}{2(-1)}$
 $= 2$
 $-4 + 8 + 5$
 $= 9$

Domain:
 \mathbb{R}

Range: $y \leq 9$

6. $c(x) = 3x^2 + 6x$

Domain:
 \mathbb{R}

Range: $y \geq -3$
 $3 - 6 = -3$

$a = 3$
 $b = 6$
 $x = -\frac{6}{2(3)}$
 $x = -1$

7. The cables between the bridge in form a parabola that can be modeled by $y = 0.00016x^2 - 0.46x + 507$, where x and y are measured in feet.

(a) What is the distance between the two towers?

$$x = -\frac{b}{2a}$$

$$a = 0.00016 \quad b = -0.46$$

$$x = -\frac{-0.46}{2(0.00016)} = 1437.5$$

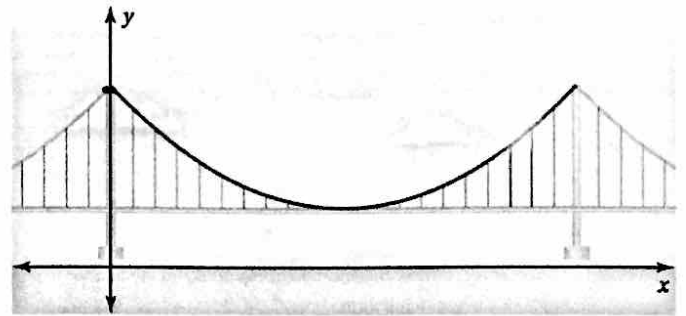
$$1437.5 \cdot 2 = 2875$$

2875 ft between the 2 towers

(b) What is the height of the cable above the water at its lowest point?

$$y = 0.00016(1437.5)^2 - 0.46(1437.5) + 507$$

$$= 176.375 \text{ ft above the water.}$$



8. The function shown models the height (in feet) of a softball t seconds after it is pitched in an underhand motion. Describe the domain and range. Find the maximum height of the softball.

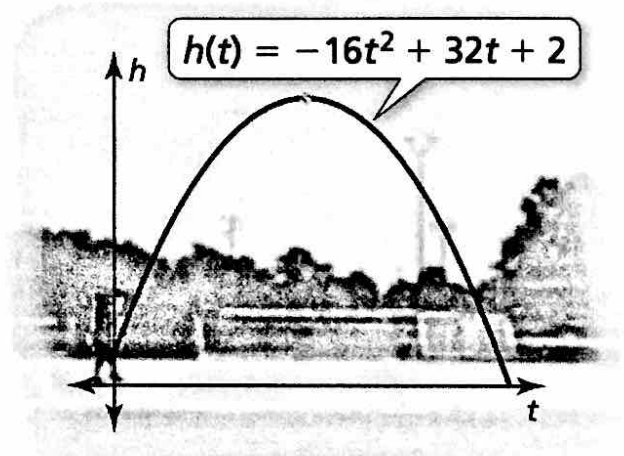
Domain: \mathbb{R} $x = -\frac{b}{2a}$

Range: $y \leq 18$ $x = -\frac{32}{2(-16)} = 1$

$$h(1) = -16 + 32 + 2$$

$$h = 18 \text{ ft}$$

The maximum height of the ball is 18 ft.



Tell whether the function has a minimum value or a maximum value. Then find the vertex, the maximum or minimum value and the axis of symmetry.

9. $f(x) = 2x^2 + 2x - 5$

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

$$a = 2 \quad b = 2$$

$$f\left(-\frac{1}{2}\right) = 2\left(-\frac{1}{2}\right)^2 + 2\left(-\frac{1}{2}\right) - 5 = -5.5$$

Maximum or Minimum <i>Mini</i>	Vertex $\left(-\frac{1}{2}, -5.5\right)$
Max. or Min. Value -5.5	Axis of Symmetry $x = -\frac{1}{2}$

10. $g(x) = 4x^2 + 8x - 3$

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

$$b = 8$$

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

$$4 - 8 - 3$$

Maximum or Minimum <i>Minimum</i>	Vertex $(-1, -7)$
Max. or Min. Value -7	Axis of Symmetry $x = -1$