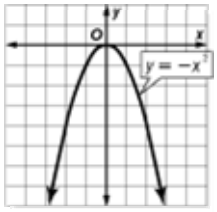
Lesson 10-2

Example 1 Graph Quadratic Functions
Graph $y = -x^2$.

To graph a quadratic function, make a table of values, plot the ordered pairs, and connect the points with a smooth curve.

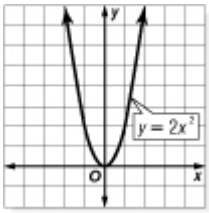
x	$-x^2$	y	(x, y)
–2	$-(-2)^2 = -4$	–4	(–2, –4)
–1	$-(-1)^2 = -1$	–1	(–1, –1)
0	$-(0)^2 = 0$	0	(0, 0)
1	$-(1)^2 = -1$	–1	(1, –1)
2	$-(2)^2 = -4$	–4	(2, –4)



Example 2 Graph Quadratic Functions
Graph $y = 2x^2$.

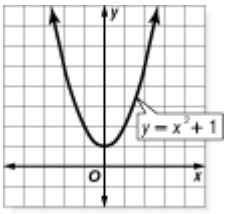
To graph a quadratic function, make a table of values, plot the ordered pairs, and connect the points with a smooth curve.

x	$2x^2$	y	(x, y)
–2	$2(-2)^2 = 8$	8	(–2, 8)
–1	$2(-1)^2 = 2$	2	(–1, 2)
0	$2(0)^2 = 0$	0	(0, 0)
1	$2(1)^2 = 2$	2	(1, 2)
2	$2(2)^2 = 8$	8	(2, 8)



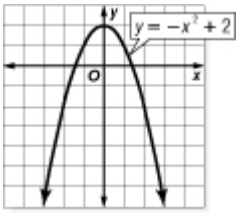
Example 3 Graph Quadratic Functions
Graph $y = x^2 + 1$.

x	$x^2 + 1$	y	(x, y)
–2	$(-2)^2 + 1 = 5$	5	(–2, 5)
–1	$(-1)^2 + 1 = 2$	2	(–1, 2)
0	$(0)^2 + 1 = 1$	1	(0, 1)
1	$(1)^2 + 1 = 2$	2	(1, 2)
2	$(2)^2 + 1 = 5$	5	(2, 5)



Example 4 Graph Quadratic Functions
Graph $y = -x^2 + 2$.

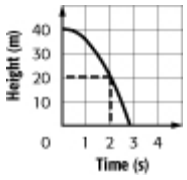
x	$-x^2 + 2$	y	(x, y)
–2	$-(-2)^2 + 2 = -2$	–2	(–2, –2)
–1	$-(-1)^2 + 2 = 1$	1	(–1, 1)
0	$-(0)^2 + 2 = 2$	2	(0, 2)
1	$-(1)^2 + 2 = 1$	1	(1, 1)
2	$-(2)^2 + 2 = -2$	–2	(2, –2)



Example 5 Real-World Example
SCIENCE The function $h = 40 - 4.9t^2$ represents the height (in meters) of a fireworks rocket after t seconds. Graph this function. Then use your graph to estimate the height of the rocket after 2 seconds.

The equation $h = 40 - 4.9t^2$ is quadratic, since the variable t has an exponent of 2. Time cannot be negative, so use only positive values of t.

t	$h = 40 - 4.9t^2$	(t, h)
0	$40 - 4.9(0)^2 = 40$	(0, 40)
0.5	$40 - 4.9(0.5)^2 = 38.8$	(0.5, 38.8)
1	$40 - 4.9(1)^2 = 35.1$	(1, 35.1)
1.5	$40 - 4.9(1.5)^2 = 29.0$	(1.5, 29.0)
2	$40 - 4.9(2)^2 = 20.4$	(2, 20.4)
2.5	$40 - 4.9(2.5)^2 = 9.4$	(2.5, 9.4)



At a time of 2 seconds, the fireworks rocket would be 20.4 meters.