

Lesson 13-6

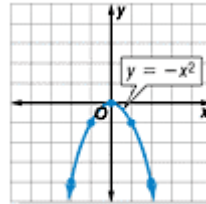
Example 1 Graph Quadratic Equations

Graph each function.

a. $y = -x^2$

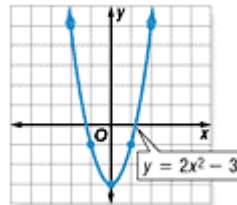
Make a table of values, plot the ordered pairs, and connect the points with a curve.

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



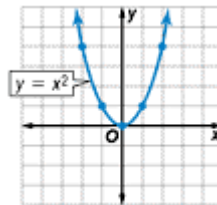
b. $y = 2x^2 - 3$

x	$y = 2x^2 - 3$	(x, y)
-2	$2(-2)^2 - 3 = 5$	$(-2, 5)$
-1	$2(-1)^2 - 3 = -1$	$(-1, -1)$
0	$2(0)^2 - 3 = -3$	$(0, -3)$
1	$2(1)^2 - 3 = -1$	$(1, -1)$
2	$2(2)^2 - 3 = 5$	$(2, 5)$



c. $y = x^2$

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



Example 2 Use a Function to Solve a Problem

NATURE The height of a tree is equal to 0.5 times the number of years since planting squared. Graph this function and determine how tall the tree will be after 3.5 years.

Words Height is equal to 0.5 times the years squared.

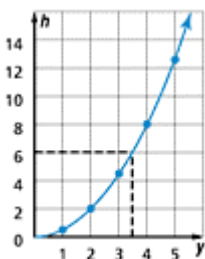
Variables Let h = height in feet and y = years since planting.

Equation

Height	is equal		0.5	times	the number of
to	to	=	to	to	years squared.
}			}	}	}
h			0.5	\cdot	y^2

The equation is $h = 0.5y^2$. Since the variable y has an exponent of 2, this function is nonlinear. Now graph $h = 0.5y^2$. Since the number of years since planting cannot be negative, use only positive values of y .

y	$h = 0.5y^2$	(y, h)
1	$0.5(1)^2 = 0.5$	$(1, 0.5)$
2	$0.5(2)^2 = 2$	$(2, 2)$
3	$0.5(3)^2 = 4.5$	$(3, 4.5)$
4	$0.5(4)^2 = 8$	$(4, 8)$
5	$0.5(5)^2 = 12.5$	$(5, 12.5)$

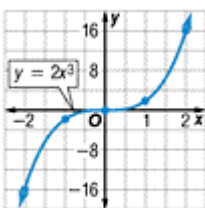


By looking at the graph, we find that after 3.5 years, the tree will be approximately 6 feet tall.

Example 3 Graph a Cubic Function

a. $y = 2x^3$

x	$y = 2x^3$	(x, y)
-2	$2(-2)^3 = -16$	$(-2, -16)$
-1	$2(-1)^3 = -2$	$(-1, -2)$
0	$2(0)^3 = 0$	$(0, 0)$
1	$2(1)^3 = 2$	$(1, 2)$
2	$2(2)^3 = 16$	$(2, 16)$



b. $y = x^3 - 3$

x	$y = x^3 - 3$	(x, y)
-2	$(-2)^3 - 3 = -11$	$(-2, -11)$
-1	$(-1)^3 - 3 = -4$	$(-1, -4)$
0	$(0)^3 - 3 = -3$	$(0, -3)$
1	$(1)^3 - 3 = -2$	$(1, -2)$
2	$(2)^3 - 3 = 5$	$(2, 5)$

