Algebra II
Lesson #1 Unit 8
Class Worksheet #1
For Worksheets #1 - #3

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Now we will do class worksheet #1.

Algebra II Class Worksheet #1 Unit 8

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$$h = -16t^2 + 160t + 500$$

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$$h = -64 + 320$$

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2. What is the height of the ball after 6 seconds?

Find h, if $t = 6$.

$$h = -16t^2 + 160t + 500$$

$$h = -16(6)^2 + 160(6) + 500$$

$$h = -576 + 960 + 500 =$$

This is the most basic type of problem.
You are given a value of t and are asked to find h.
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A steel ball is propelled upward from a point that is 500 feet above the ground with an initial velocity of 160 feet per second. The equation $h = -16t^2 + 160t + 500$ expresses the height of the ball, h, (in feet) as a function of the time, t, (in seconds).

3. When will the ball be 644 feet above the ground?

Find t, if $h = 644$.

$$h = -16t^2 + 160t + 500$$

$$644 = -16t^2 + 160t + 500$$

$$0 = -16t^2 + 160t - 144$$

$$0 = t^2 - 10t + 9$$

$$0 = (t - 1)(t - 9)$$

$t - 1 = 0$ or

Apply the zero property of multiplication.

This time you are given a value of h and are asked to find t.

Step 1: Substitute the given value of h into the equation.

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Solve each equation.

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Subtract 500 from each side.

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Divide each side by -16.

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$$0 = t^2 - 10t$$

Factor.

This time you are given a value of h and are asked to find t.

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Solve each equation.

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It will be 500 feet above the ground again after <u>10 seconds.</u>

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5. **When will the ball be 400 feet above the ground?**

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$$400 = -16t^2 + 160t + 500$$

$$0 =$$

Subtract 400 from each side.

This time you are given a value of h and are asked to find t.

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Algebra II Class Worksheet #1 Unit 8

A steel ball is propelled upward from a point that is 500 feet above the ground with an initial velocity of 160 feet per second. The equation $h = -16t^2 + 160t + 500$ expresses the height of the ball, h, (in feet) as a function of the time, t, (in seconds).

5. When will the ball be 400 feet above the ground?

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$$h = -16t^2 + 160t + 500$$

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Divide each side by -4.

This time you are given a value of h and are asked to find t.

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Find t, if h = 400.

$$0 = 4t^2 - 40t$$

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$$0 = 4t^2 - 40t - 25$$

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$$h = -16t^2 + 160t + 500$$

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$$t \approx$$

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$$t = \frac{40 \pm \sqrt{1600 - (4)(4)(-25)}}{8} = \frac{40 \pm \sqrt{2000}}{8}$$

$$t \approx 10.6$$

This time you are given a value of h and are asked to find t.

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$t \approx 10.6$ or

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$t \approx 10.6$ or $t \approx \cancel{-0.6}$

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$$t \approx 10.6 \text{ or } t \approx \cancel{-0.6}$$

It will be 400 feet above the ground after about <u>10.6 seconds.</u>

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Find t, if h = 400.

$$h = -16t^2 + 160t + 500$$

$$400 = -16t^2 + 160t + 500$$

$$0 = -16t^2 + 160t + 100$$

$$0 = 4t^2 - 40t - 25$$

$$t = \frac{40 \pm \sqrt{1600 - (4)(4)(-25)}}{8} = \frac{40 \pm \sqrt{2000}}{8}$$

$$t \approx 10.6 \quad \text{or} \quad t \approx \cancel{-0.6}$$

It will be 400 feet above the ground after about <u>10.6 seconds.</u>

Algebra II Class Worksheet #1 Unit 8

A steel ball is propelled upward from a point that is 500 feet above the ground with an initial velocity of 160 feet per second. The equation $h = -16t^2 + 160t + 500$ expresses the height of the ball, h, (in feet) as a function of the time, t, (in seconds).

6. When will the ball hit the ground?

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Find t, if $h = 0$.

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6. When will the ball hit the ground?

Find t, if $h = 0$.

This time you are given a value of h and are asked to find t.

Step 1: Substitute the given value of h into the equation.

Step 2: Solve for t. You may be able to use the factoring method to solve for t. If that 'won't work', use the quadratic formula.

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6. When will the ball hit the ground?

Find t, if h = 0.

$$h = -16t^2 + 160t + 500$$

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Find t, if $h = 0$.

$$h = -16t^2 + 160t + 500$$

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6. When will the ball hit the ground?

Find t, if h = 0.

$$h = -16t^2 + 160t + 500$$

$$0 =$$

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Find t, if h = 0.

$$h = -16t^2 + 160t + 500$$

$$0 = -16t^2 + 160t + 500$$

This time you are given a value of h and are asked to find t.

Step 1: Substitute the given value of h into the equation.

Step 2: Solve for t. **You may be able to use the factoring method to solve for t. If that 'won't work', use the quadratic formula.**

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6. When will the ball hit the ground?

Find t, if h = 0.

$$h = -16t^2 + 160t + 500$$

$$0 = -16t^2 + 160t + 500$$

Divide each side by -4.

This time you are given a value of h and are asked to find t.

Step 1: Substitute the given value of h into the equation.

Step 2: Solve for t. You may be able to use the factoring method to solve for t. If that 'won't work', use the quadratic formula.

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6. When will the ball hit the ground?

Find t, if h = 0.

$$h = -16t^2 + 160t + 500$$

$$0 = -16t^2 + 160t + 500$$

$$0 =$$

Divide each side by -4.

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Find t, if h = 0.

$$h = -16t^2 + 160t + 500$$

$$0 = -16t^2 + 160t + 500$$

$$0 = 4t^2$$

Divide each side by -4.

This time you are given a value of h and are asked to find t.

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6. When will the ball hit the ground?

Find t, if $h = 0$.

$$h = -16t^2 + 160t + 500$$

$$0 = -16t^2 + 160t + 500$$

$$0 = 4t^2 – 40t$$

Divide each side by -4.

This time you are given a value of h and are asked to find t.

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Find t, if h = 0.

$$h = -16t^2 + 160t + 500$$

$$0 = -16t^2 + 160t + 500$$

$$0 = 4t^2 - 40t - 125$$

Divide each side by -4.

This time you are given a value of h and are asked to find t.

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Find t, if h = 0.

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Factor.

This time you are given a value of h and are asked to find t.

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Find t, if h = 0.

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Find t, if h = 0.

$h = -16t^2 + 160t + 500$

$0 = -16t^2 + 160t + 500$

$0 = 4t^2 - 40t - 125$

Factor.

$0 = (2t - 25)($

This time you are given a value of h and are asked to find t.

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6. When will the ball hit the ground?

Find t, if h = 0.

$$h = -16t^2 + 160t + 500$$

$$0 = -16t^2 + 160t + 500$$

$$0 = 4t^2 - 40t - 125$$

Factor.

$$0 = (2t - 25)(2t + 5)$$

This time you are given a value of h and are asked to find t.

Step 1: Substitute the given value of h into the equation.

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$$0 = 4t^2 - 40t - 125$$

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$$h = -16t^2 + 160t + 500$$

$$0 = -16t^2 + 160t + 500$$

$$0 = 4t^2 - 40t - 125$$

$$0 = (2t - 25)(2t + 5)$$

Apply the zero property of multiplication.

This time you are given a value of h and are asked to find t.

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6. When will the ball hit the ground?

Find t, if $h = 0$.

$h = -16t^2 + 160t + 500$

$0 = -16t^2 + 160t + 500$

$0 = 4t^2 - 40t - 125$

$0 = (2t - 25)(2t + 5)$

$2t - 25$

Apply the zero property of multiplication.

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Find t, if $h = 0$.

$$h = -16t^2 + 160t + 500$$

$$0 = -16t^2 + 160t + 500$$

$$0 = 4t^2 - 40t - 125$$

$$0 = (2t - 25)(2t + 5)$$

$$2t - 25 = 0$$

Apply the zero property of multiplication.

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Find t, if $h = 0$.

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$$2t - 25 = 0 \quad \text{or}$$

Apply the zero property of multiplication.

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$$0 = 4t^2 - 40t - 125$$

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$$2t - 25 = 0 \quad \text{or} \quad 2t + 5$$

Apply the zero property of multiplication.

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$$0 = 4t^2 - 40t - 125$$

$$0 = (2t - 25)(2t + 5)$$

$$2t - 25 = 0 \quad \text{or} \quad 2t + 5 = 0$$

This time you are given a value of h and are asked to find t.

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6. When will the ball hit the ground?

Find t, if h = 0.

$h = -16t^2 + 160t + 500$

$0 = -16t^2 + 160t + 500$

$0 = 4t^2 - 40t - 125$

$0 = (2t - 25)(2t + 5)$

$2t - 25 = 0$ or $2t + 5 = 0$

Solve each equation.

This time you are given a value of h and are asked to find t.

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Step 2: Solve for t. You may be able to use **the factoring method** to solve for t. If that 'won't work', use the quadratic formula.

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$0 = -16t^2 + 160t + 500$

$0 = 4t^2 - 40t - 125$

$0 = (2t - 25)(2t + 5)$

$2t - 25 = 0$ or $2t + 5 = 0$

$t =$

Solve each equation.

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Find t, if h = 0.

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$$0 = -16t^2 + 160t + 500$$

$$0 = 4t^2 - 40t - 125$$

$$0 = (2t - 25)(2t + 5)$$

$$2t - 25 = 0 \quad \text{or} \quad 2t + 5 = 0$$

$$t = 12.5$$

Solve each equation.

This time you are given a value of h and are asked to find t.

Step 1: Substitute the given value of h into the equation.

Step 2: Solve for t. You may be able to use **the factoring method** to solve for t. If that 'won't work', use the quadratic formula.

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$2t - 25 = 0$ or $2t + 5 = 0$

$t = 12.5$ or

Solve each equation.

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$0 = (2t - 25)(2t + 5)$

$2t - 25 = 0$ or $2t + 5 = 0$

$t = 12.5$ or $t =$

Solve each equation.

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$0 = 4t^2 - 40t - 125$

$0 = (2t - 25)(2t + 5)$

$2t - 25 = 0$ or $2t + 5 = 0$

$t = 12.5$ or $t = -2.5$

Solve each equation.

This time you are given a value of h and are asked to find t.

Step 1: Substitute the given value of h into the equation.

Step 2: Solve for t. You may be able to use the factoring method to solve for t. If that 'won't work', use the quadratic formula.

Algebra II Class Worksheet #1 Unit 8

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6. When will the ball hit the ground?

Find t, if $h = 0$.

$$h = -16t^2 + 160t + 500$$

$$0 = -16t^2 + 160t + 500$$

$$0 = 4t^2 - 40t - 125$$

$$0 = (2t - 25)(2t + 5)$$

$$2t - 25 = 0 \quad \text{or} \quad 2t + 5 = 0$$

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It will hit the ground after <u>12.5 seconds.</u>

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the 'vertex form' of the equation is $y - y_1 = A(x - x_1)^2$.

The vertex of the function is (x_1, y_1) !!!

Algebra II Class Worksheet #1 Unit 8

A steel ball is propelled upward from a point that is 500 feet above the ground with an initial velocity of 160 feet per second. The equation $h = -16t^2 + 160t + 500$ expresses the height of the ball, h, (in feet) as a function of the time, t, (in seconds).

7. What is the maximum height reached by the ball?

Find the vertex !!

$h = -16t^2 + 160t + 500$

$h - 500 = -16t^2 + 160t$

$h - 500 = -16(t^2 - 10t)$

Complete the square.

$h - 500 - 400 = -16(t^2 - 10t + 25)$

$h - 900 =$

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$$h = -16t^2 + 160t + 500$$

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The vertex is (5, 900).

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t

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The vertex is (5, 900).

t h

The maximum height is 900 feet.

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$h - 900 = -16(t - 5)^2$

The vertex is (5, 900).

t h

The maximum height is 900 feet.

How long did it take the ball to reach its maximum height?

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$$h - 900 = -16(t - 5)^2$$

The vertex is (5, 900).

t h

The maximum height is 900 feet.

How long did it take the ball to reach its maximum height?

It took the ball 5 seconds to reach its maximum height.

Algebra II Class Worksheet #1 Unit 8

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$$h - 900 = -16(t - 5)^2$$

The vertex is $(\underset{t}{5}, \underset{h}{900})$.

The maximum height is 900 feet.

How long did it take the ball to reach its maximum height?

It took the ball 5 seconds to reach its maximum height.

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8. Sketch a graph of this function from $t = 0$ until the ball hits the ground.

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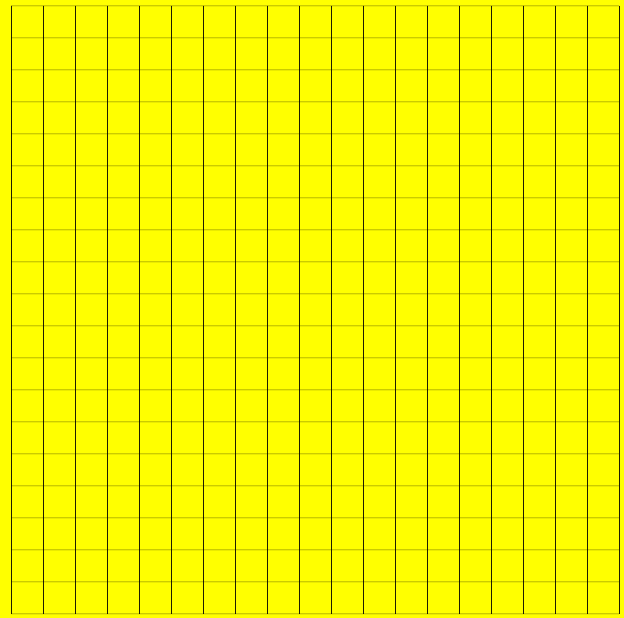

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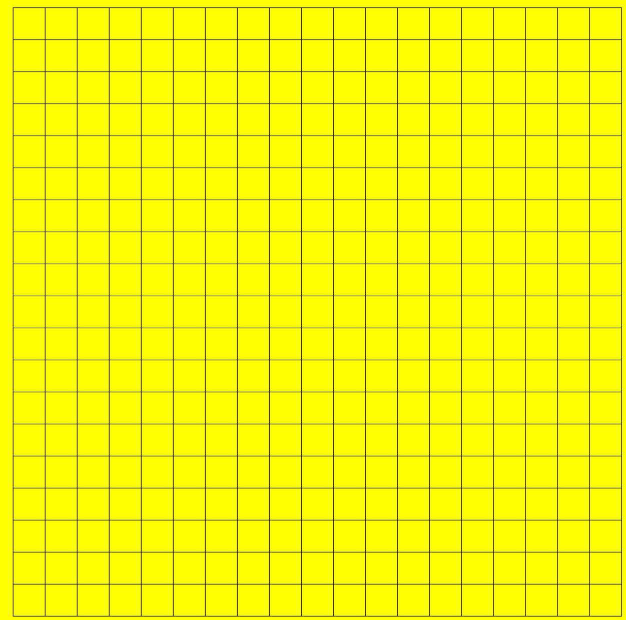

Graphing a Second Degree Function

Step 1: Fill out a table of values.

Step 2: Plot the points and draw the graph.

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8. Sketch a graph of this function from $t = 0$ until the ball hits the ground.

t	h
0	
1	
2	
3	
4	
5	
6	

t	h
7	
8	
9	
10	
11	
12	
12.5	

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8. Sketch a graph of this function from $t = 0$ until the ball hits the ground.

t	h	t	h
0		7	
1		8	
2		9	
3		10	
4		11	
5		12	
6		12.5	

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t	h
0	
1	
2	
3	
4	
5	
6	

t	h
7	
8	
9	
10	
11	
12	
12.5	

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8. Sketch a graph of this function from $t = 0$ until the ball hits the ground.

t	h
0	500
1	
2	
3	
4	
5	
6	

t	h
7	
8	
9	
10	
11	
12	
12.5	

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8. Sketch a graph of this function from $t = 0$ until the ball hits the ground.

t	h
0	500
1	
2	
3	
4	
5	
6	

t	h
7	
8	
9	
10	
11	
12	
12.5	

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8. Sketch a graph of this function from $t = 0$ until the ball hits the ground.

t	h
0	500
1	
2	
3	
4	
5	
6	

t	h
7	
8	
9	
10	
11	
12	
12.5	

We have determined that the ball hits the ground in 12.5 seconds.

Graphing a Second Degree Function

Step 1: Fill out a table of values.

Step 2: Plot the points and draw the graph.

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8. Sketch a graph of this function from $t = 0$ until the ball hits the ground.

t	h	t	h
0	500	7	
1		8	
2		9	
3		10	
4		11	
5		12	
6		12.5	

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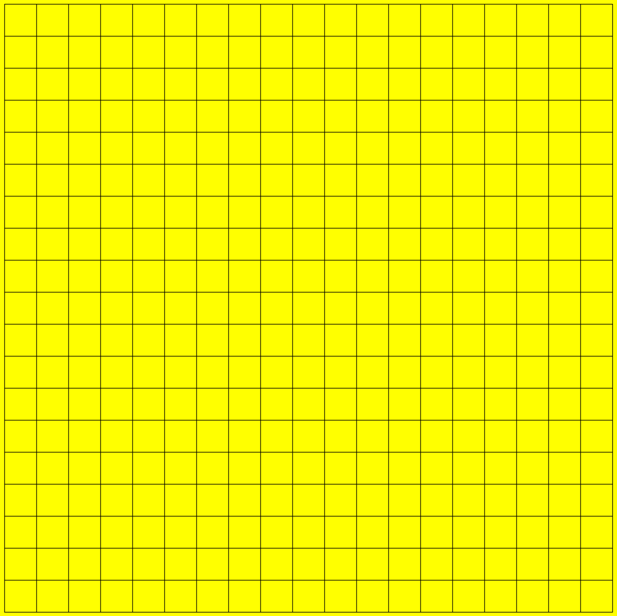
t	h
0	500
1	
2	
3	
4	
5	
6	

t	h
7	
8	
9	
10	
11	
12	
12.5	0

We have determined that the ball hits the ground in 12.5 seconds.



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t	h
0	500
1	
2	
3	
4	
5	
6	

t	h
7	
8	
9	
10	
11	
12	
12.5	0

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t	h	t	h
0	500	7	
1		8	
2		9	
3		10	
4		11	
5		12	
6		12.5	0

We have determined that the ball reaches its maximum height of 900 feet in 5 seconds.

Graphing a Second Degree Function

Step 1: Fill out a table of values.

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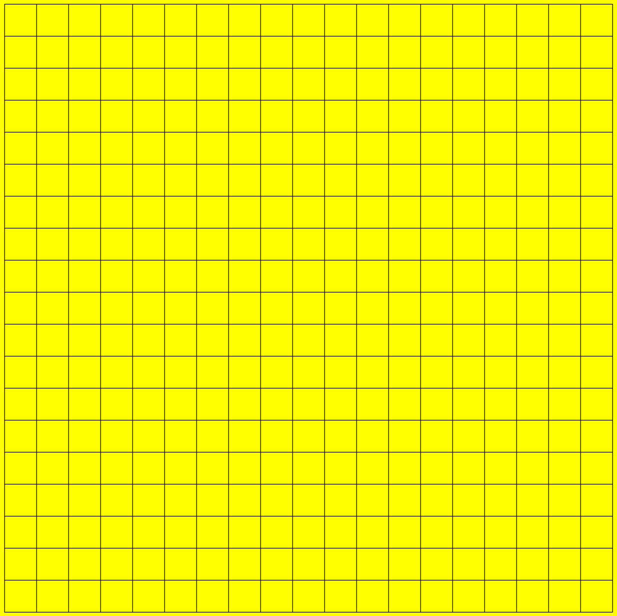
t	h
0	500
1	
2	
3	
4	
5	
6	

t	h
7	
8	
9	
10	
11	
12	
12.5	0

We have determined that the ball reaches its maximum height of 900 feet in 5 seconds.



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t	h
0	500
1	
2	
3	
4	
5	900
6	

t	h
7	
8	
9	
10	
11	
12	
12.5	0

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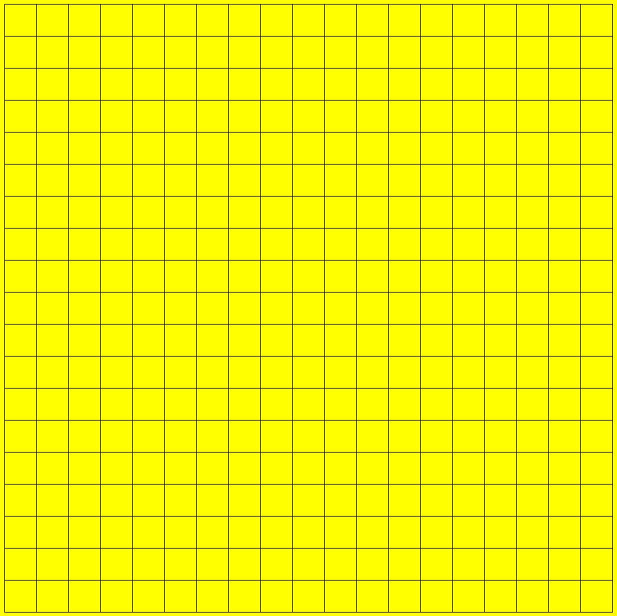

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t	h	t	h
0	500	7	
1		8	
2		9	
3		10	
4		11	
5	900	12	
6		12.5	0

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1	
2	
3	
4	
5	900
6	

t	h
7	
8	
9	
10	
11	
12	
12.5	0

We will use these 3 points to determine the scale we will use for the graph.

Graphing a Second Degree Function

Step 1: Fill out a table of values.

Step 2: Plot the points and draw the graph.

Algebra II Class Worksheet #1 Unit 8

A steel ball is propelled upward from a point that is 500 feet above the ground with an initial velocity of 160 feet per second. The equation $h = -16t^2 + 160t + 500$ expresses the height of the ball, h, (in feet) as a function of the time, t, (in seconds).

8. Sketch a graph of this function from $t = 0$ until the ball hits the ground.

t	h
0	500
1	
2	
3	
4	
5	900
6	

t	h
7	
8	
9	
10	
11	
12	
12.5	0

We will use these 3 points to determine the scale we will use for the graph.

Graphing a Second Degree Function

Step 1: Fill out a table of values.

Step 2: Plot the points and draw the graph.

Algebra II Class Worksheet #1 Unit 8

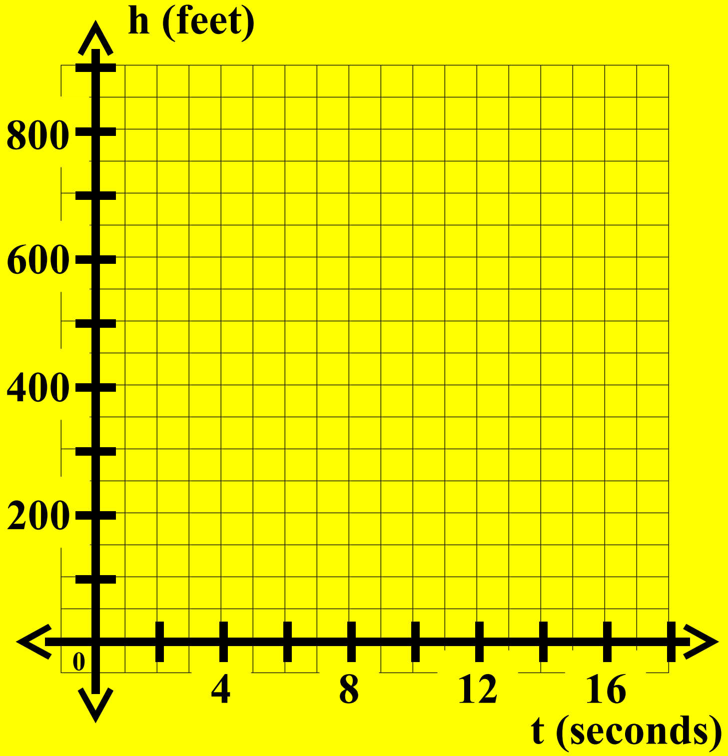
A steel ball is propelled upward from a point that is 500 feet above the ground with an initial velocity of 160 feet per second. The equation $h = -16t^2 + 160t + 500$ expresses the height of the ball, h, (in feet) as a function of the time, t, (in seconds).

8. Sketch a graph of this function from $t = 0$ until the ball hits the ground.

t	h
0	500
1	
2	
3	
4	
5	900
6	

t	h
7	
8	
9	
10	
11	
12	
12.5	0

We will use these 3 points to determine the scale we will use for the graph.



Graphing a Second Degree Function

Step 1: Fill out a table of values.

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Algebra II Class Worksheet #1 Unit 8

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8. Sketch a graph of this function from $t = 0$ until the ball hits the ground.

t	h
0	500
1	
2	
3	
4	
5	900
6	

t	h
7	
8	
9	
10	
11	
12	
12.5	0

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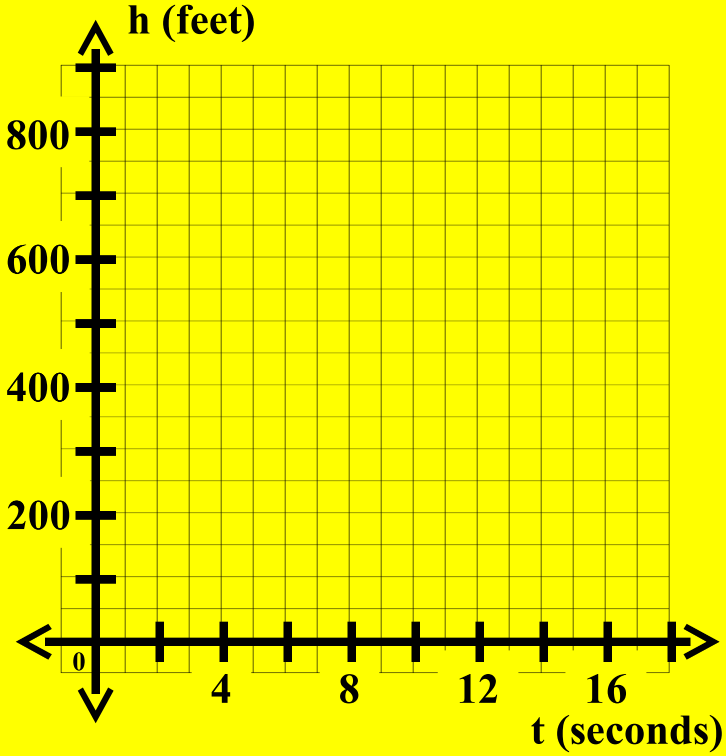

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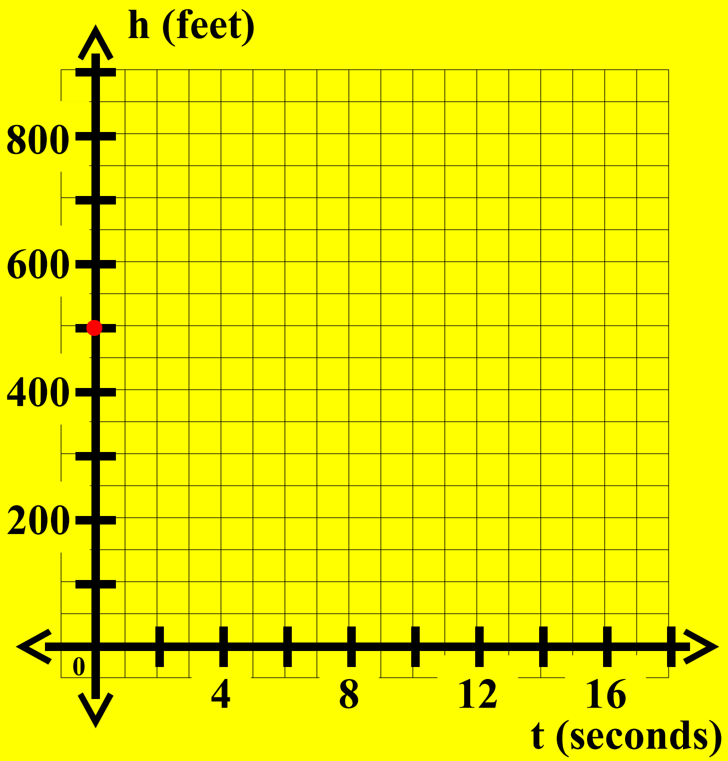
8. Sketch a graph of this function from $t = 0$ until the ball hits the ground.

t	h
0	500
1	
2	
3	
4	
5	900
6	

t	h
7	
8	
9	
10	
11	
12	
12.5	0

We will use these 3 points to determine the scale we will use for the graph.



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8. Sketch a graph of this function from $t = 0$ until the ball hits the ground.

t	h
0	500
1	
2	
3	
4	
5	900
6	

t	h
7	
8	
9	
10	
11	
12	
12.5	0

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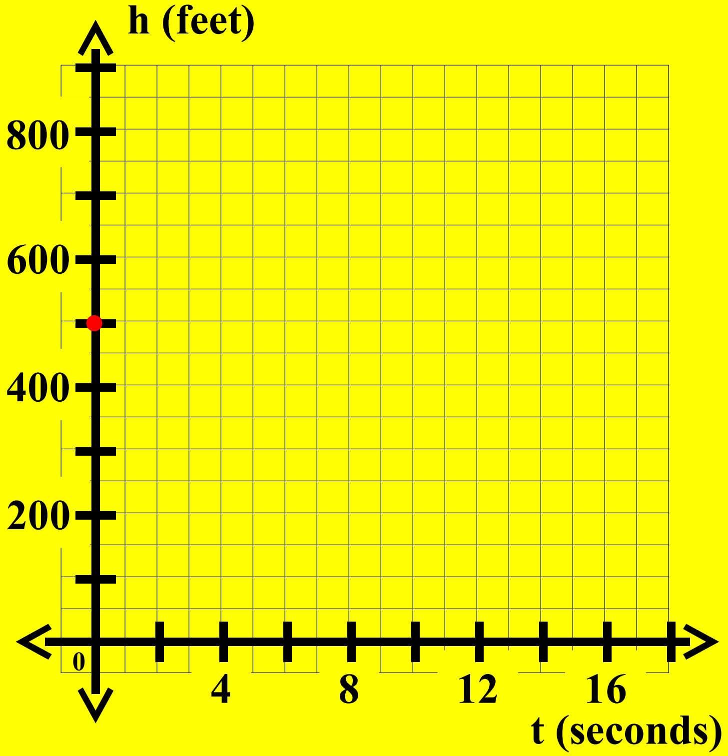

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8. Sketch a graph of this function from $t = 0$ until the ball hits the ground.

t	h
0	500
1	
2	
3	
4	
5	900
6	

t	h
7	
8	
9	
10	
11	
12	
12.5	0

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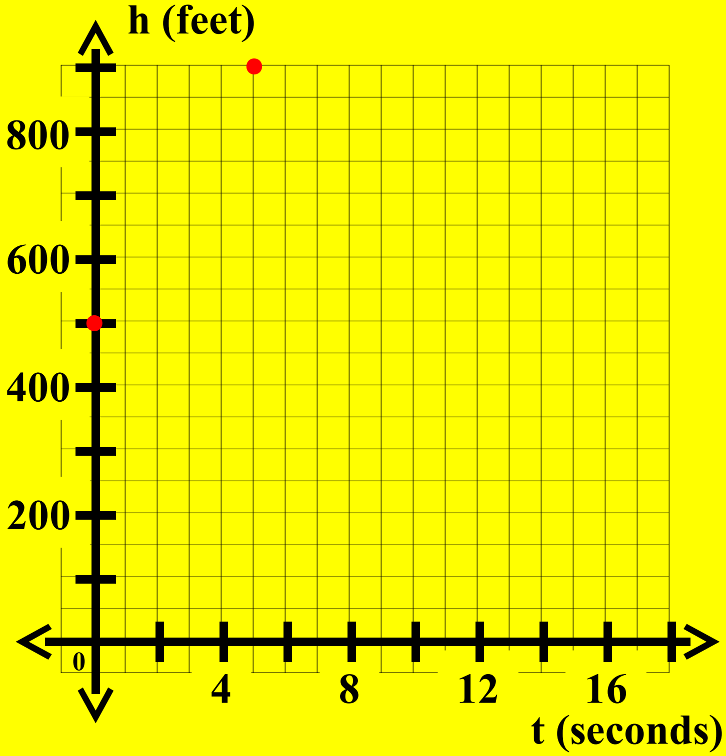

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t	h
0	500
1	
2	
3	
4	
5	900
6	

t	h
7	
8	
9	
10	
11	
12	
12.5	0

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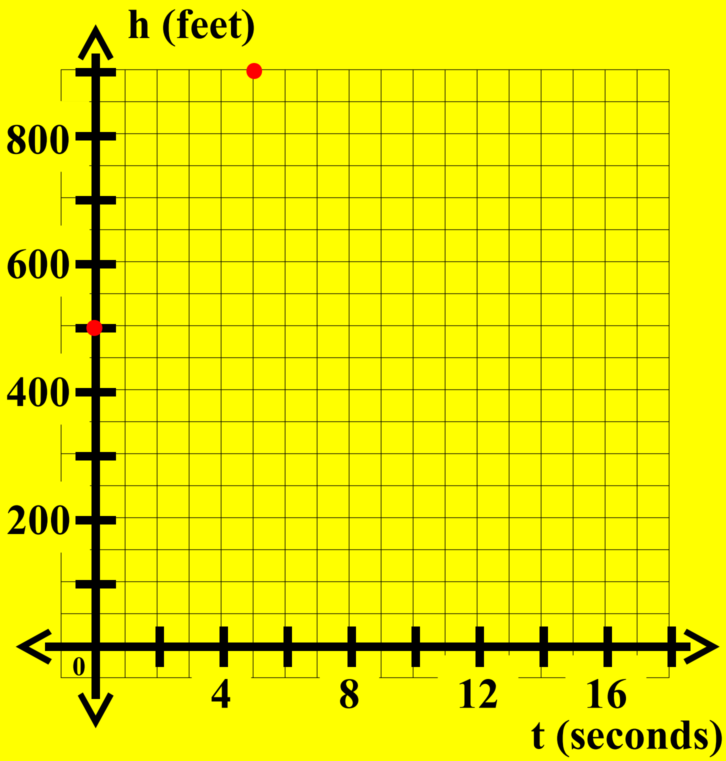

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t	h
0	500
1	
2	
3	
4	
5	900
6	

t	h
7	
8	
9	
10	
11	
12	
12.5	0

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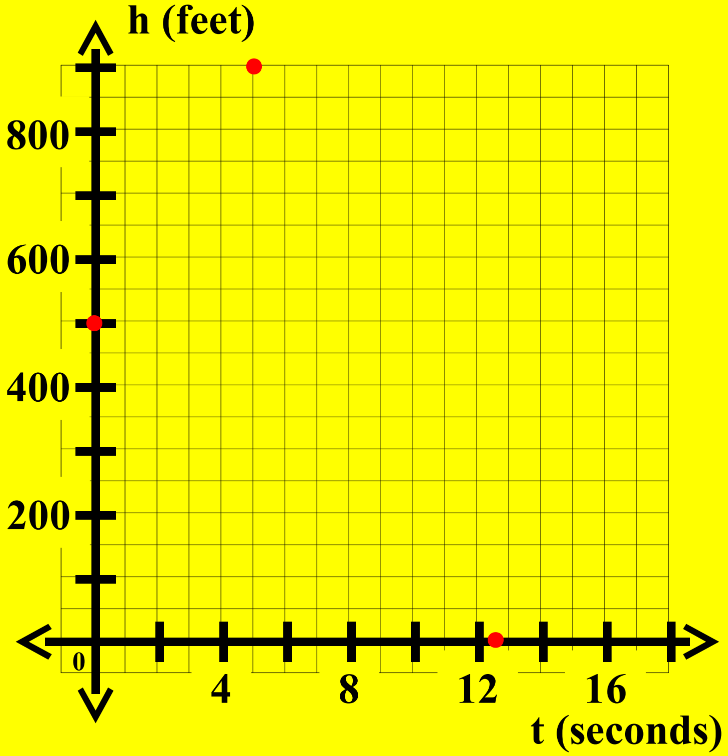

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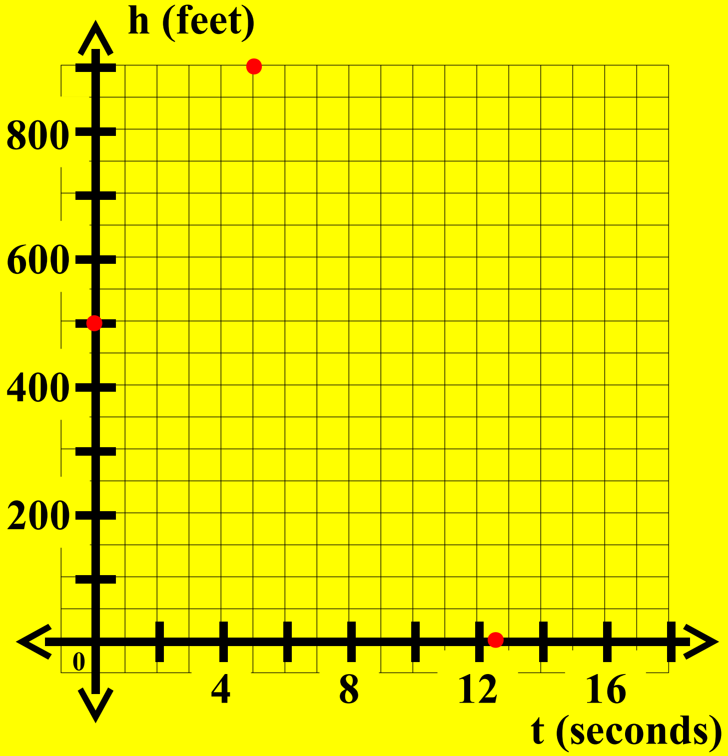
t	h
0	500
1	
2	
3	
4	
5	900
6	

t	h
7	
8	
9	
10	
11	
12	
12.5	0



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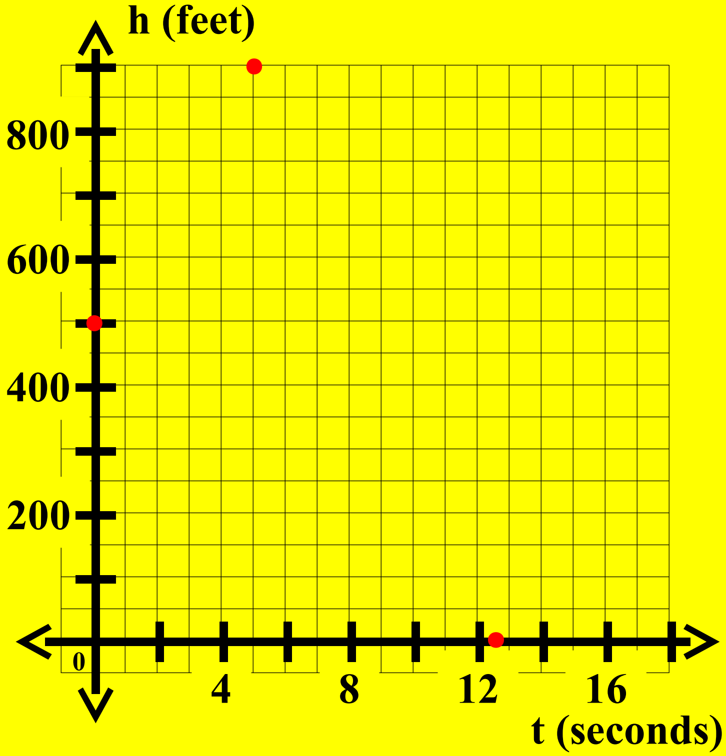
t	h
0	500
1	
2	
3	
4	
5	900
6	

t	h
7	
8	
9	
10	
11	
12	
12.5	0

Now we will add the other points to complete the graph.



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t	h
0	500
1	
2	
3	
4	
5	900
6	

t	h
7	
8	
9	
10	
11	
12	
12.5	0

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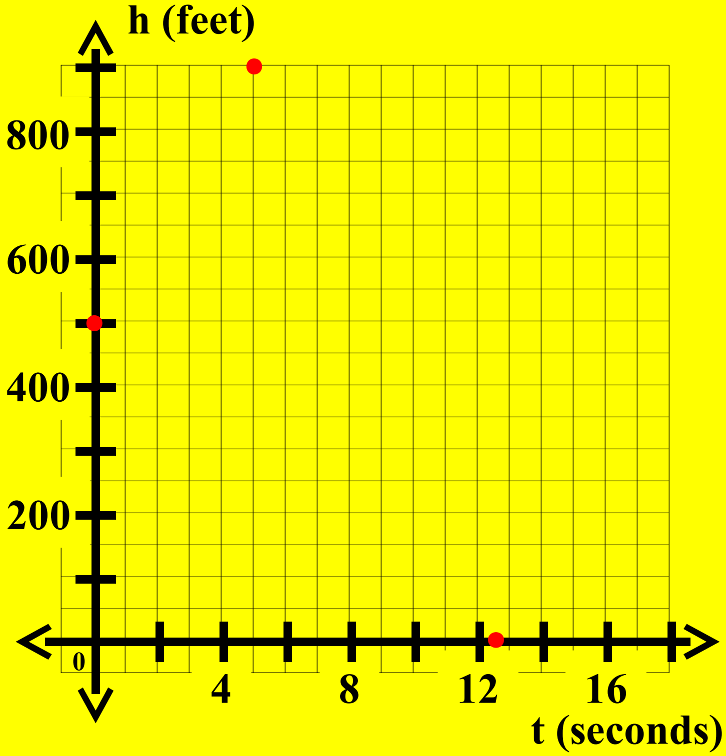

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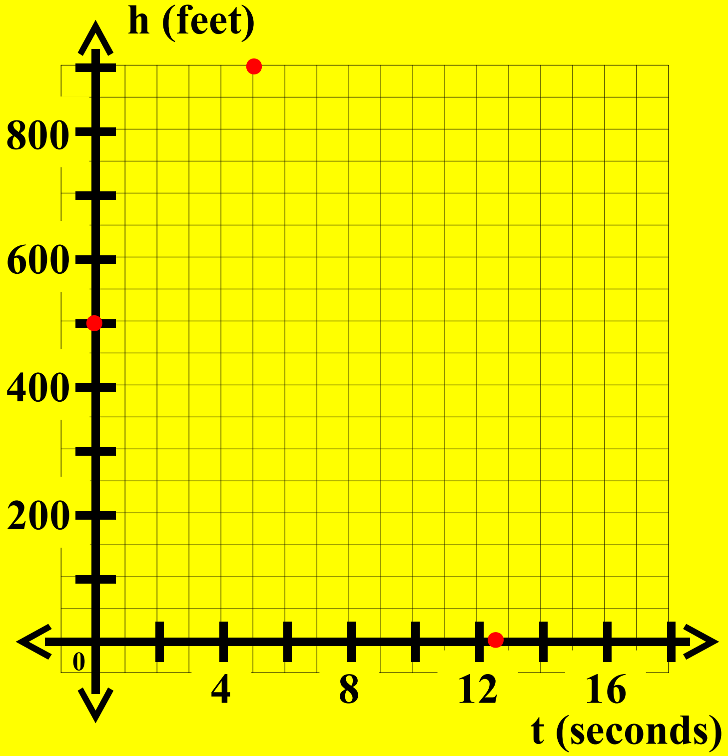
8. Sketch a graph of this function from $t = 0$ until the ball hits the ground.

t	h
0	500
1	644
2	
3	
4	
5	900
6	

t	h
7	
8	
9	
10	
11	
12	
12.5	0

Now we will add the other points to complete the graph.



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t	h
0	500
1	644
2	
3	
4	
5	900
6	

t	h
7	
8	
9	
10	
11	
12	
12.5	0

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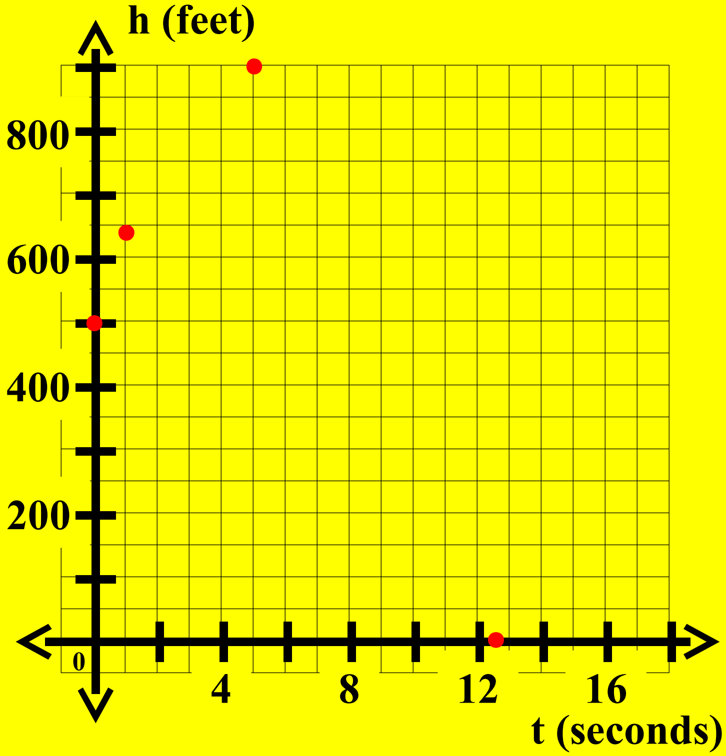

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t	h
0	500
1	644
2	
3	
4	
5	900
6	

t	h
7	
8	
9	
10	
11	
12	
12.5	0

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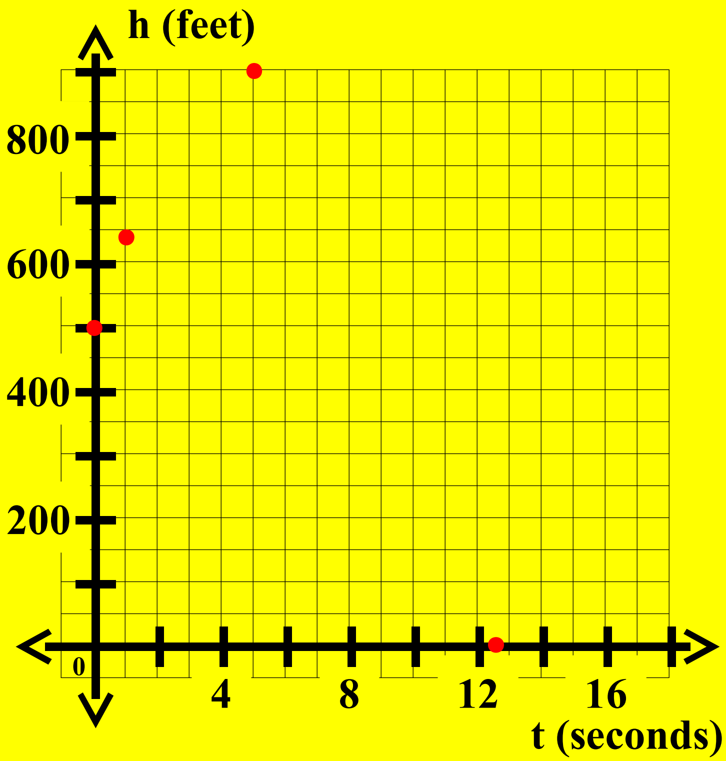

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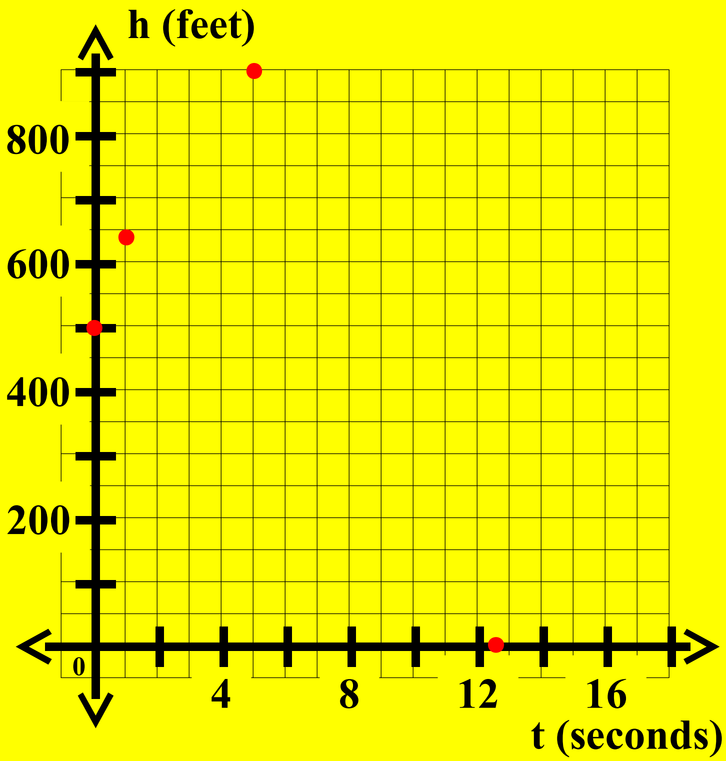
8. Sketch a graph of this function from $t = 0$ until the ball hits the ground.

t	h
0	500
1	644
2	756
3	
4	
5	900
6	

t	h
7	
8	
9	
10	
11	
12	
12.5	0

Now we will add the other points to complete the graph.



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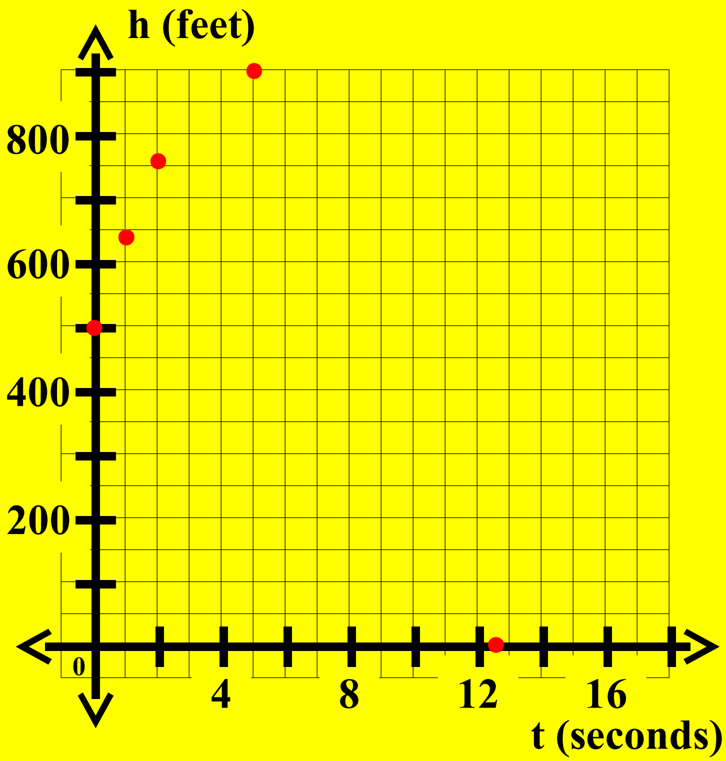
t	h
0	500
1	644
2	756
3	
4	
5	900
6	

t	h
7	
8	
9	
10	
11	
12	
12.5	0

Now we will add the other points to complete the graph.



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t	h
0	500
1	644
2	756
3	
4	
5	900
6	

t	h
7	
8	
9	
10	
11	
12	
12.5	0

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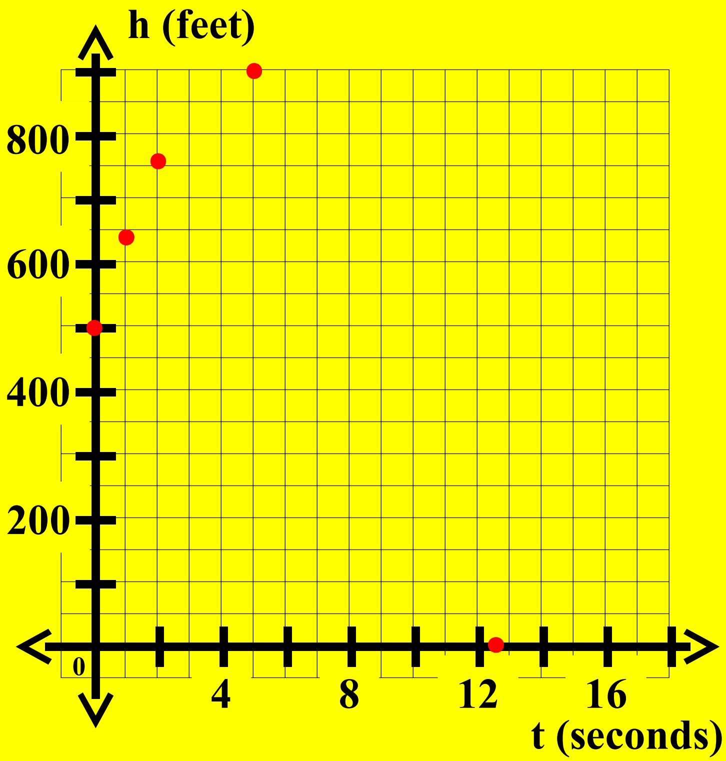

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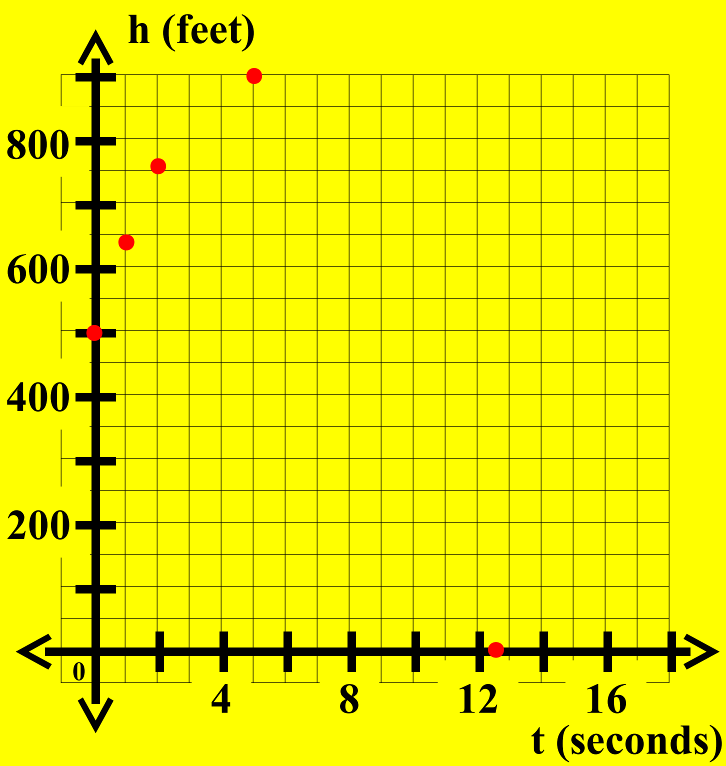
8. Sketch a graph of this function from $t = 0$ until the ball hits the ground.

t	h	t	h
0	500	7	
1	644	8	
2	756	9	
3	836	10	
4		11	
5	900	12	
6		12.5	0

Now we will add the other points to complete the graph.



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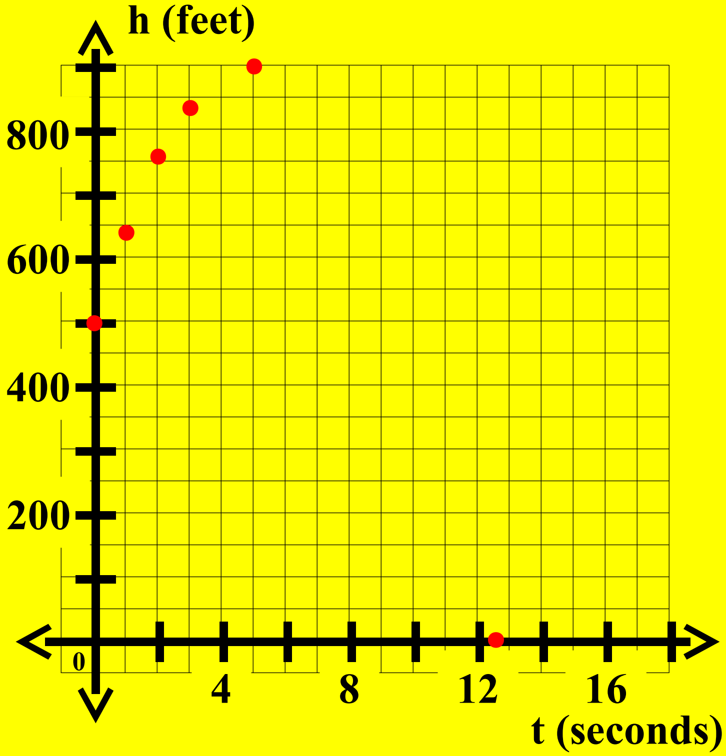
8. Sketch a graph of this function from $t = 0$ until the ball hits the ground.

t	h
0	500
1	644
2	756
3	836
4	
5	900
6	

t	h
7	
8	
9	
10	
11	
12	
12.5	0

Now we will add the other points to complete the graph.



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t	h
0	500
1	644
2	756
3	836
4	
5	900
6	

t	h
7	
8	
9	
10	
11	
12	
12.5	0

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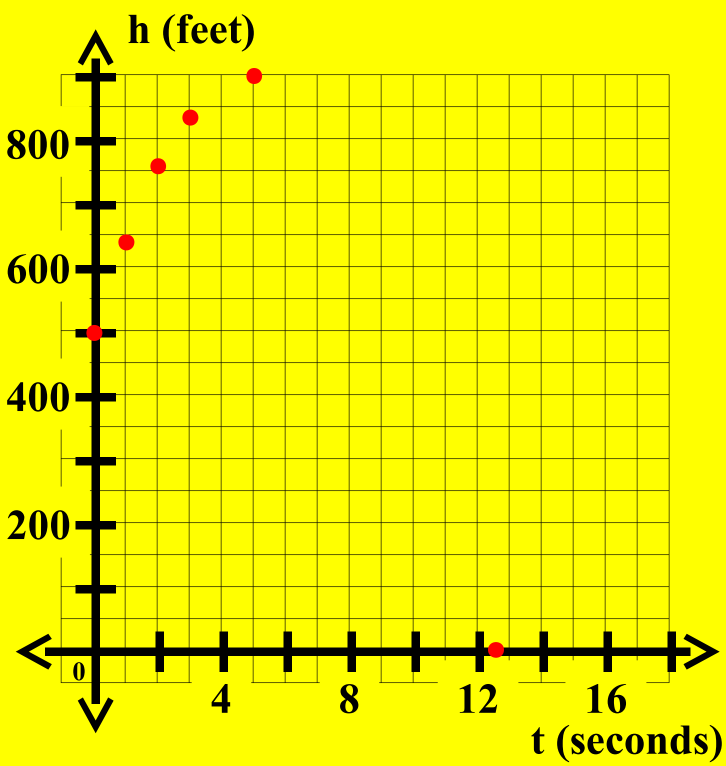

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8. Sketch a graph of this function from $t = 0$ until the ball hits the ground.

t	h
0	500
1	644
2	756
3	836
4	884
5	900
6	

t	h
7	
8	
9	
10	
11	
12	
12.5	0

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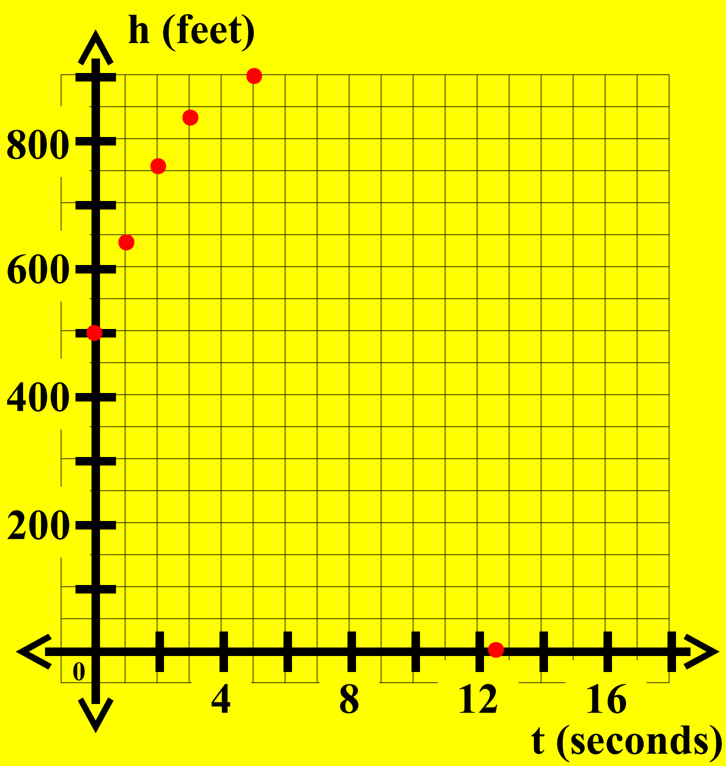

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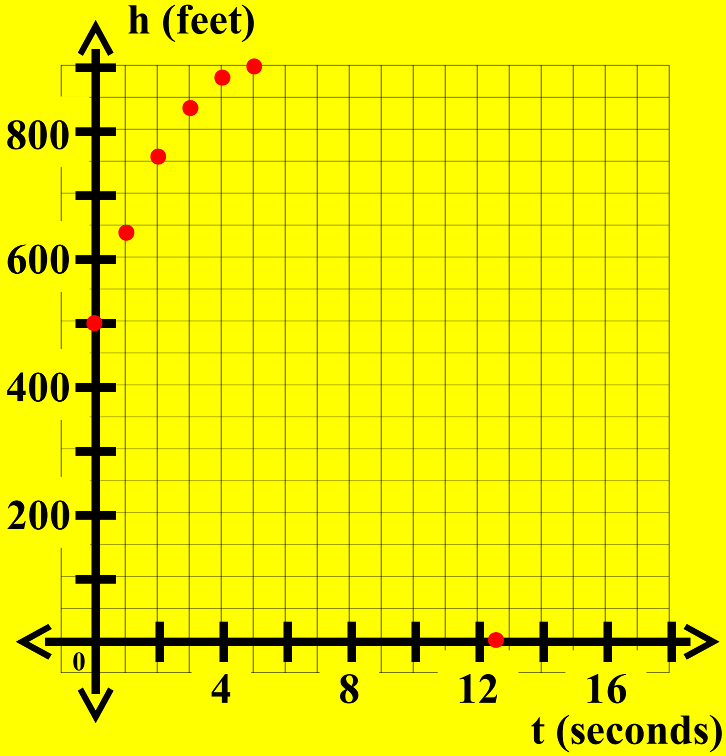
t	h
0	500
1	644
2	756
3	836
4	884
5	900
6	

t	h
7	
8	
9	
10	
11	
12	
12.5	0

Now we will add the other points to complete the graph.



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0	500
1	644
2	756
3	836
4	884
5	900
6	

t	h
7	
8	
9	
10	
11	
12	
12.5	0

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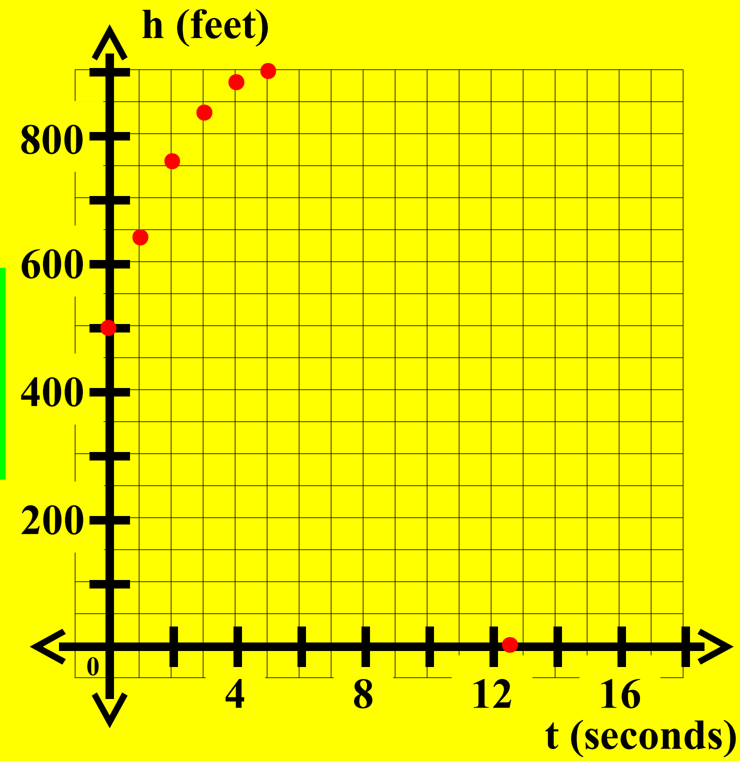

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0	500
1	644
2	756
3	836
4	884
5	900
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t	h
7	
8	
9	
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12.5	0

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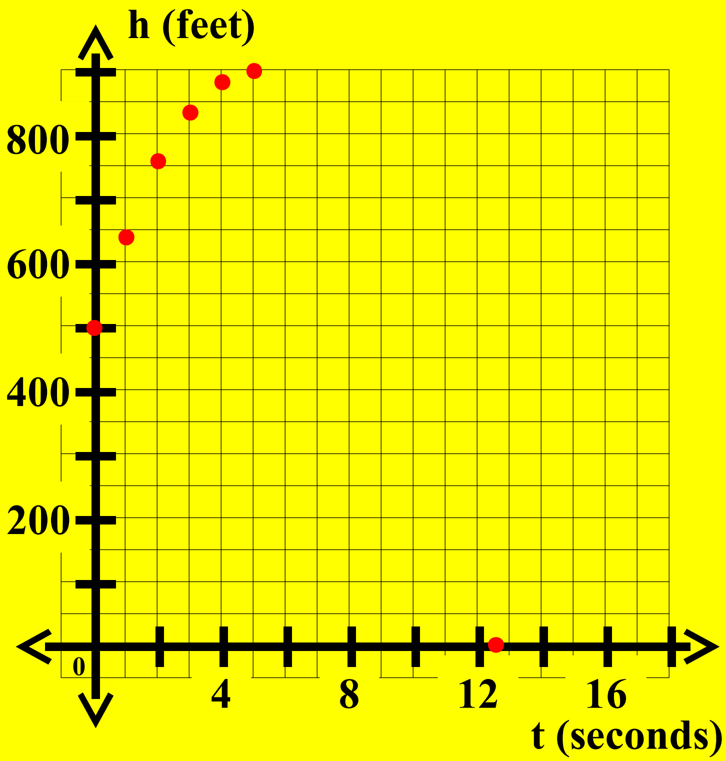

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1	644
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5	900
6	884

t	h
7	
8	
9	
10	
11	
12	
12.5	0

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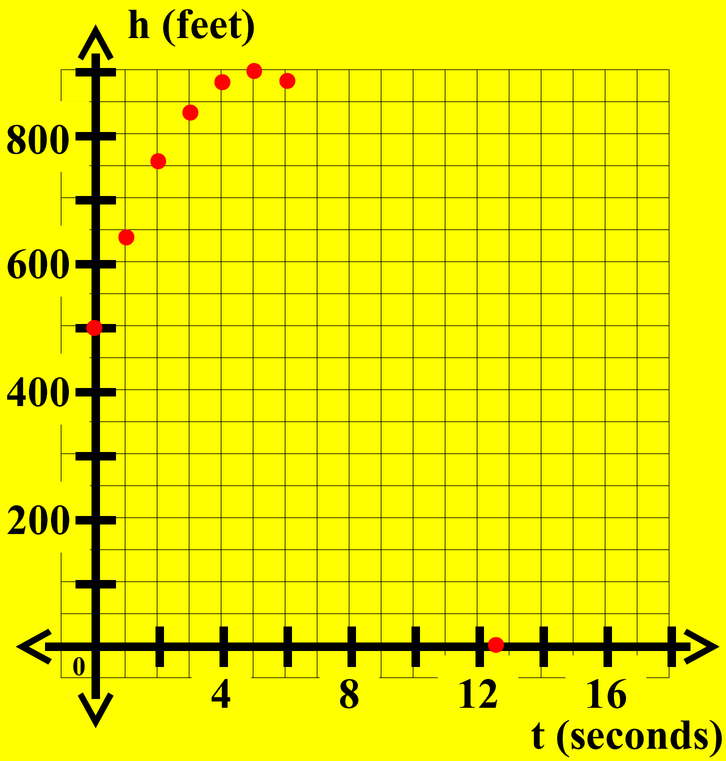


Graphing a Second Degree Function

Step 1: Fill out a table of values.

Step 2: Plot the points and draw the graph.

Algebra II Class Worksheet #1 Unit 8

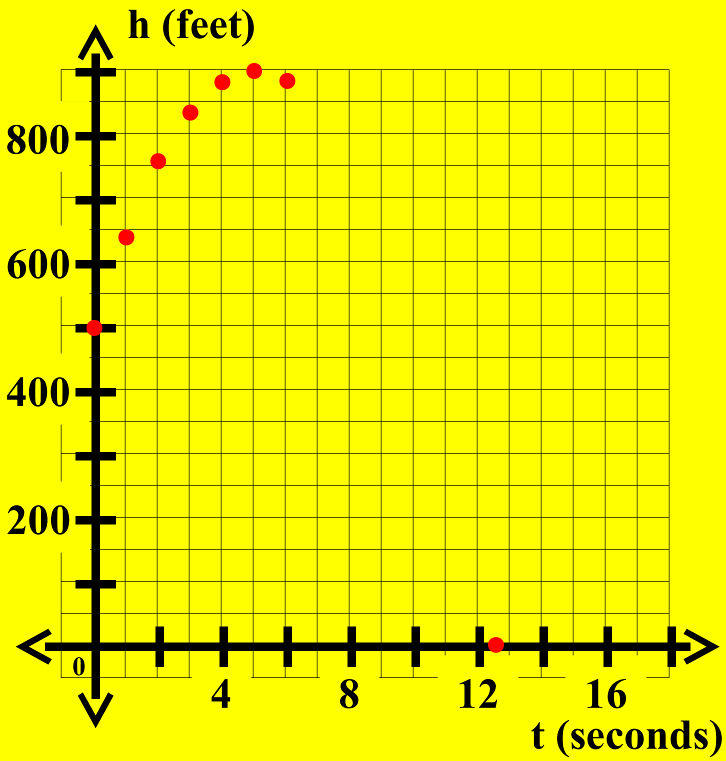
A steel ball is propelled upward from a point that is 500 feet above the ground with an initial velocity of 160 feet per second. The equation $h = -16t^2 + 160t + 500$ expresses the height of the ball, h, (in feet) as a function of the time, t, (in seconds).

8. Sketch a graph of this function from t = 0 until the ball hits the ground.

t	h
0	500
1	644
2	756
3	836
4	884
5	900
6	884

t	h
7	
8	
9	
10	
11	
12	
12.5	0

Now we will add the other points to complete the graph.



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8. Sketch a graph of this function from $t = 0$ until the ball hits the ground.

t	h
0	500
1	644
2	756
3	836
4	884
5	900
6	884

t	h
7	836
8	
9	
10	
11	
12	
12.5	0

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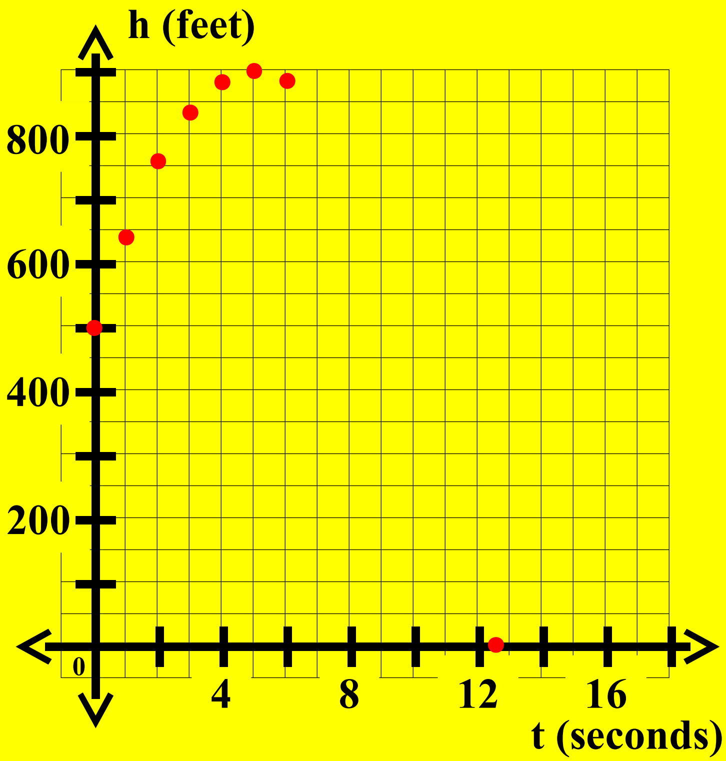

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t	h
0	500
1	644
2	756
3	836
4	884
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6	884

t	h
7	836
8	
9	
10	
11	
12	
12.5	0

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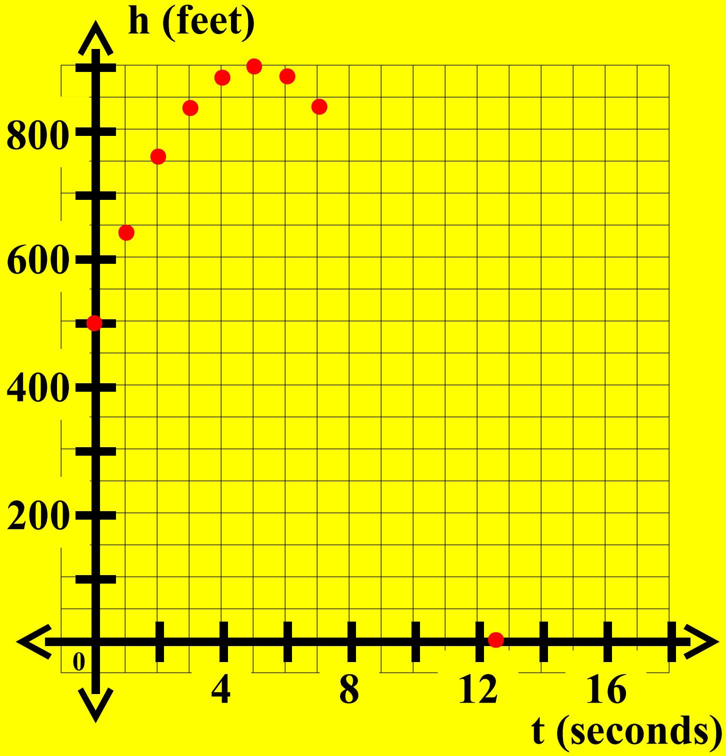

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0	500
1	644
2	756
3	836
4	884
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6	884

t	h
7	836
8	
9	
10	
11	
12	
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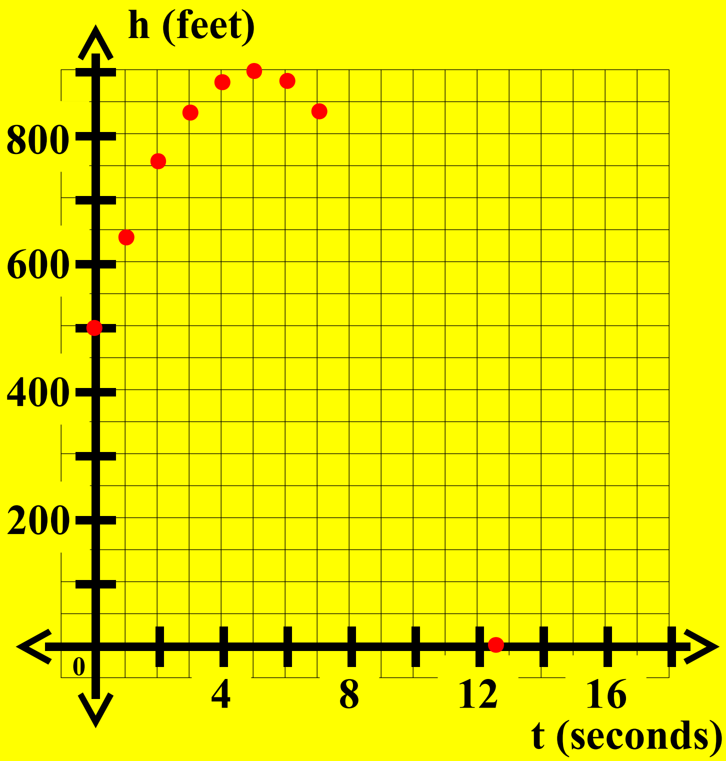

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2	756
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t	h
7	836
8	756
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10	
11	
12	
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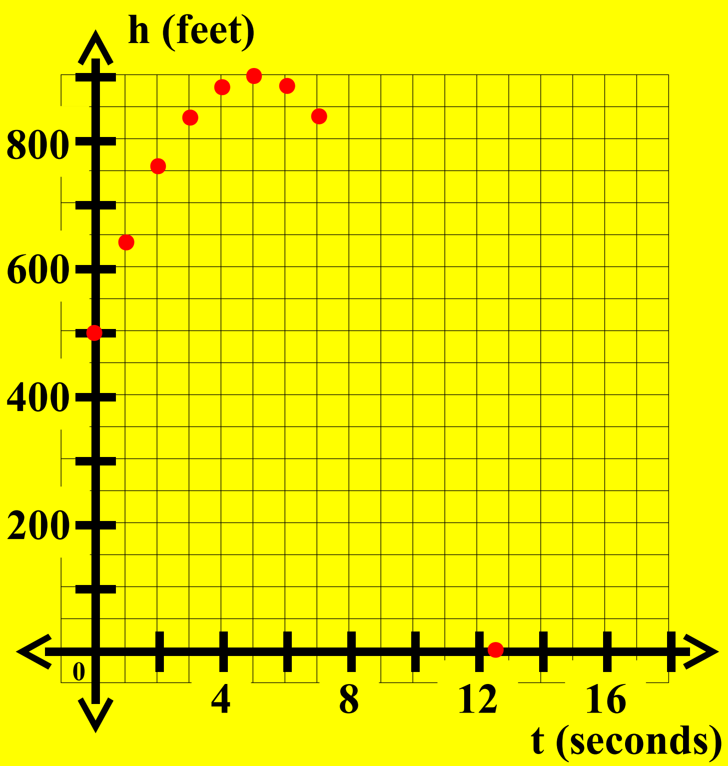

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12	
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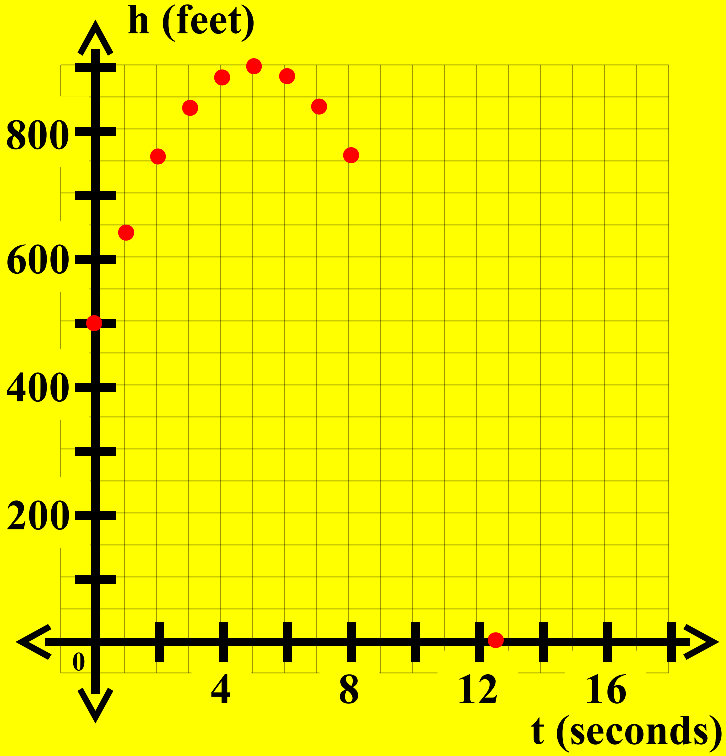

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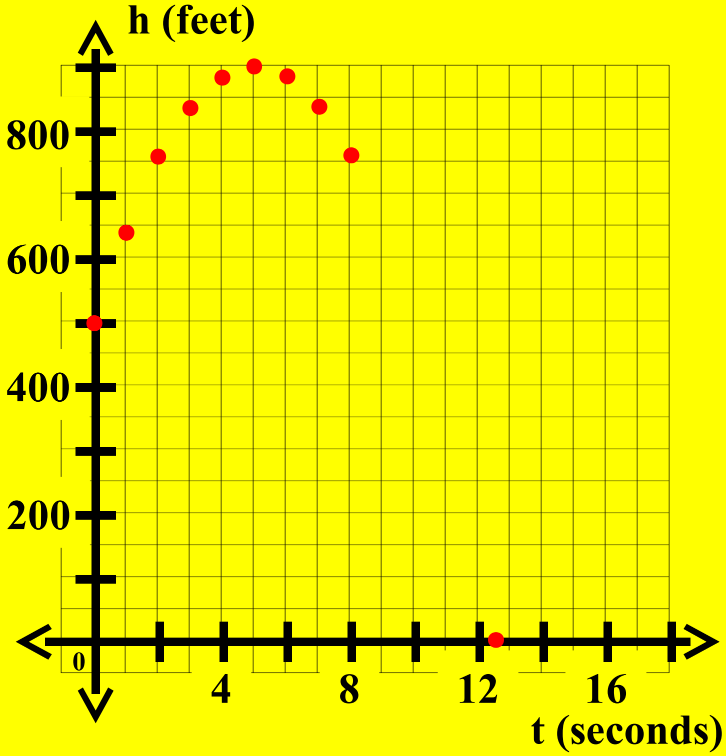

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7	836
8	756
9	644
10	
11	
12	
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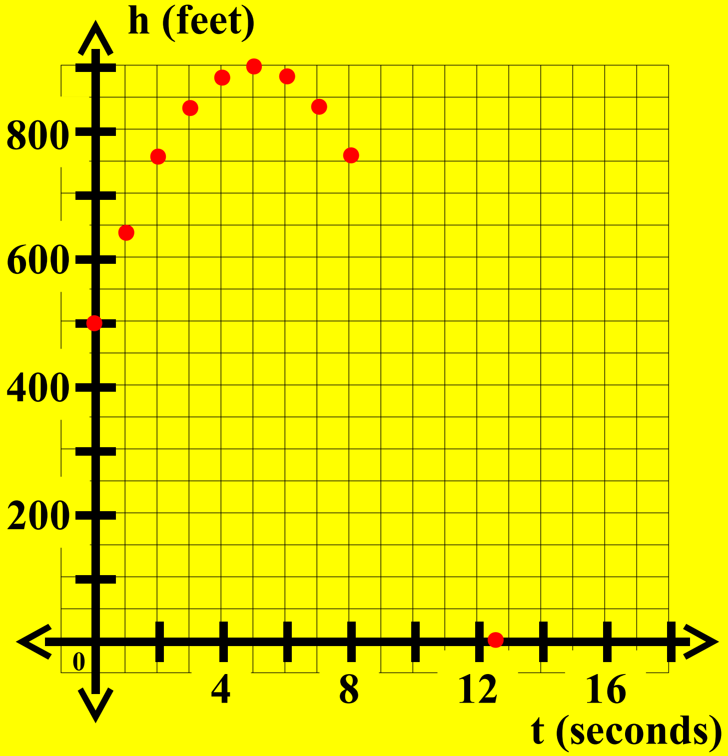

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t	h
7	836
8	756
9	644
10	
11	
12	
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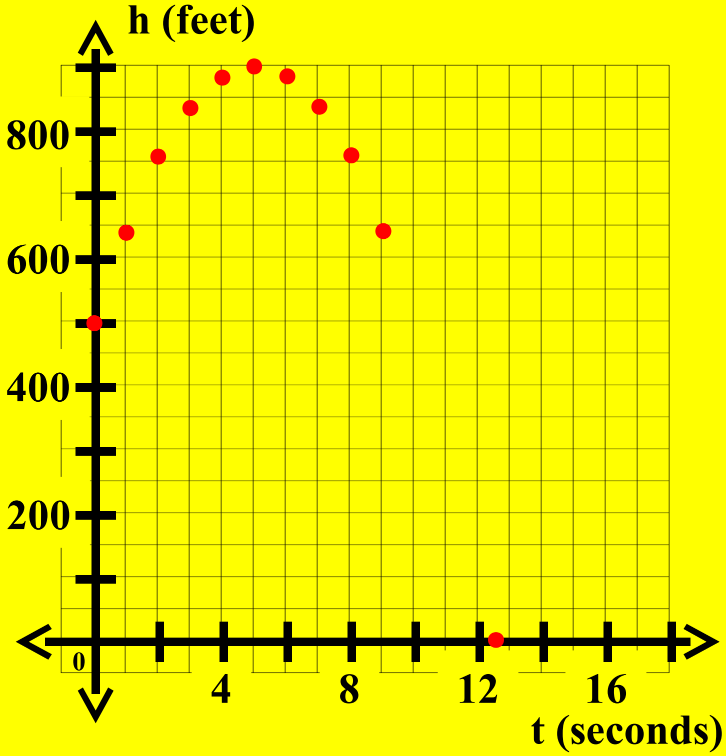

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0	500
1	644
2	756
3	836
4	884
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6	884

t	h
7	836
8	756
9	644
10	
11	
12	
12.5	0

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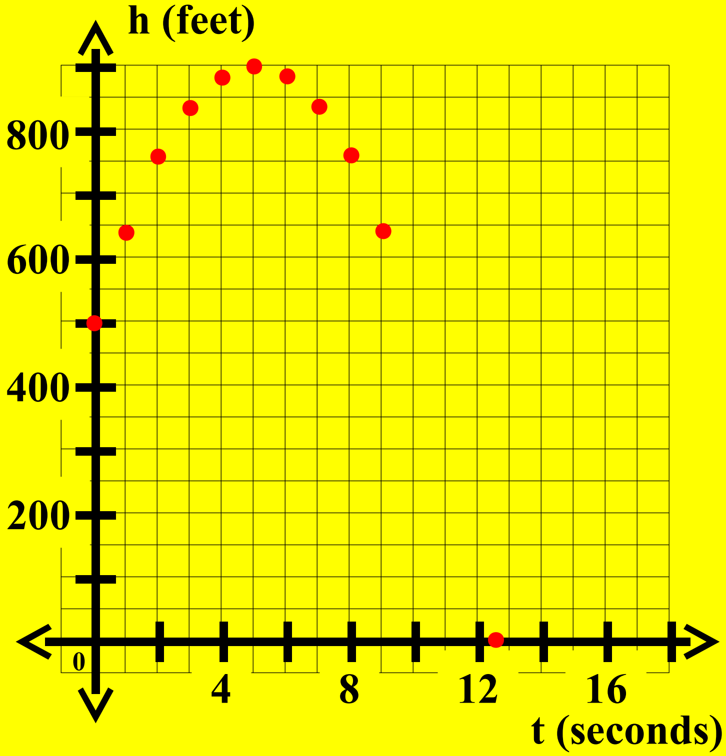

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t	h
7	836
8	756
9	644
10	500
11	
12	
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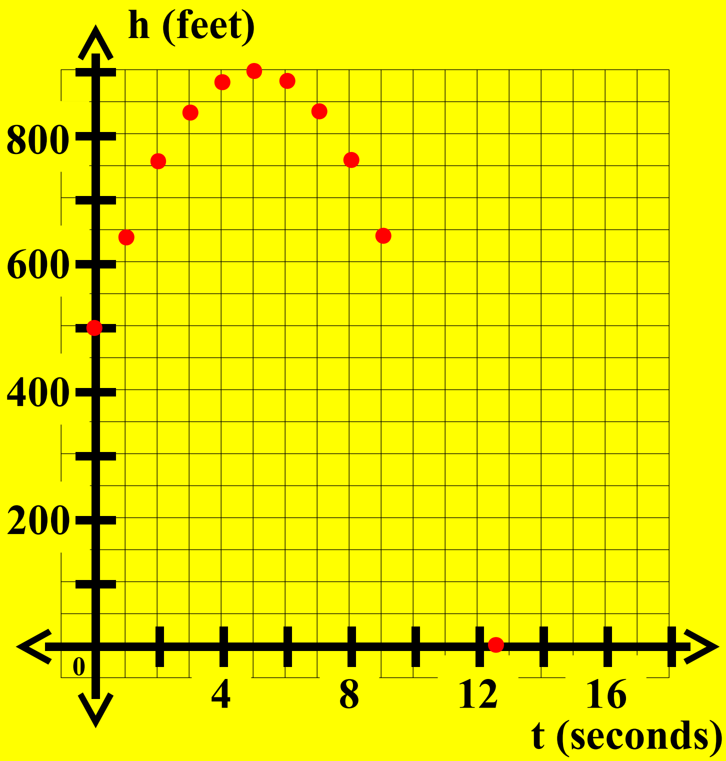

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0	500
1	644
2	756
3	836
4	884
5	900
6	884

t	h
7	836
8	756
9	644
10	500
11	
12	
12.5	0

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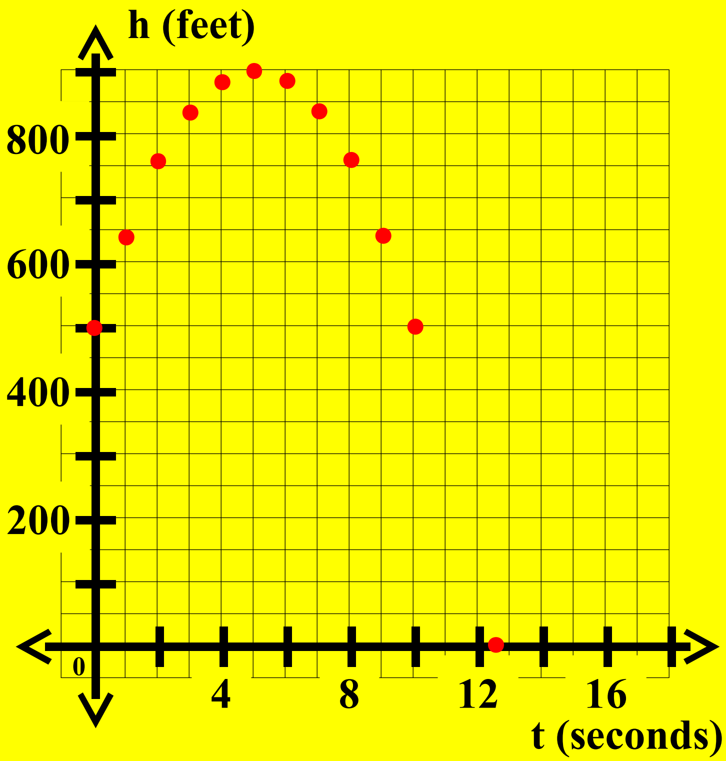

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0	500
1	644
2	756
3	836
4	884
5	900
6	884

t	h
7	836
8	756
9	644
10	500
11	
12	
12.5	0

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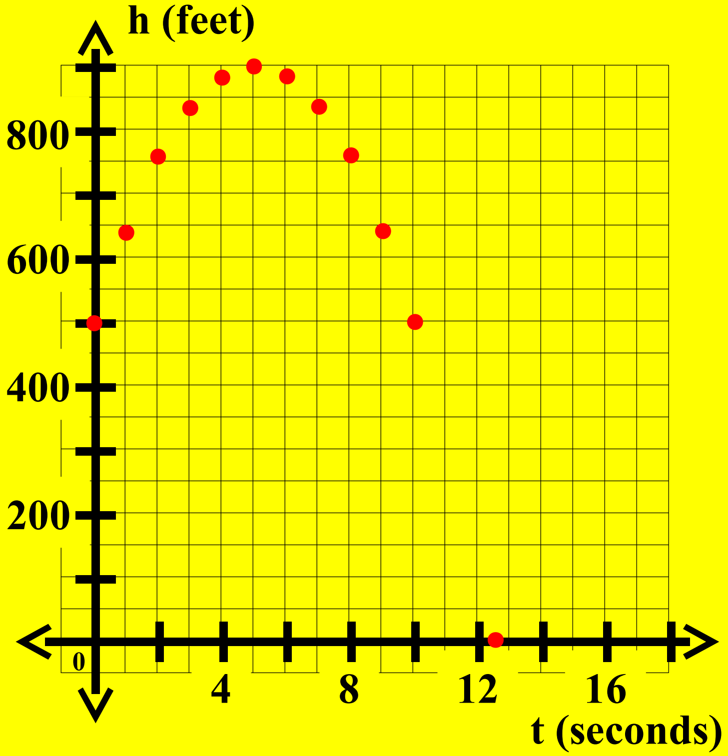

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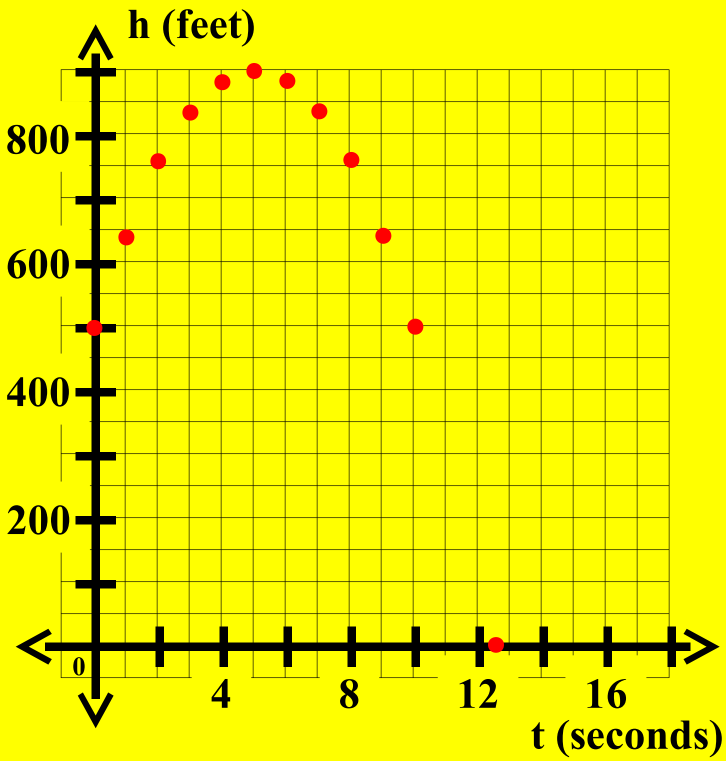
0	500
1	644
2	756
3	836
4	884
5	900
6	884

t	h
7	836
8	756
9	644
10	500
11	324
12	
12.5	0

Now we will add the other points to complete the graph.



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t	h	t	h
0	500	7	836
1	644	8	756
2	756	9	644
3	836	10	500
4	884	11	324
5	900	12	
6	884	12.5	0

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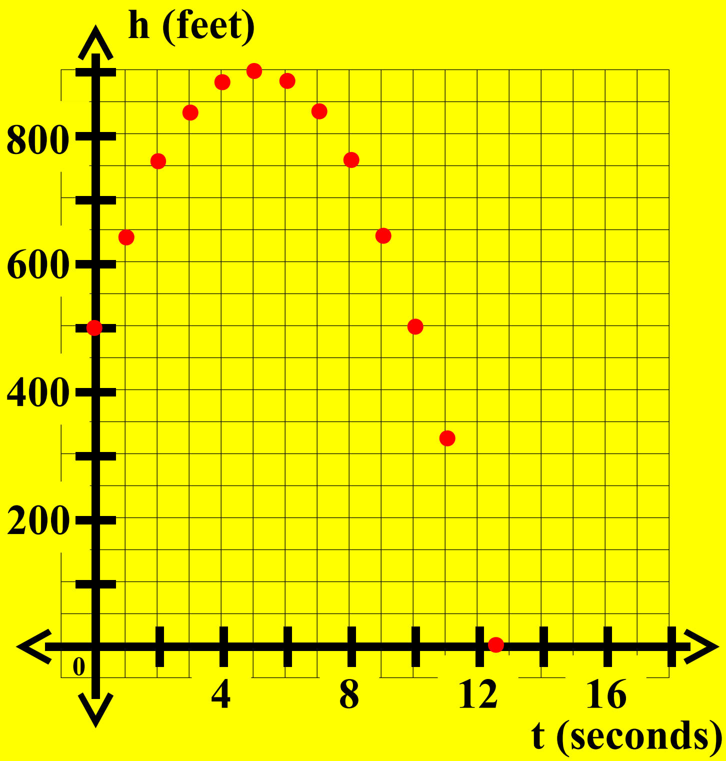

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9	644
10	500
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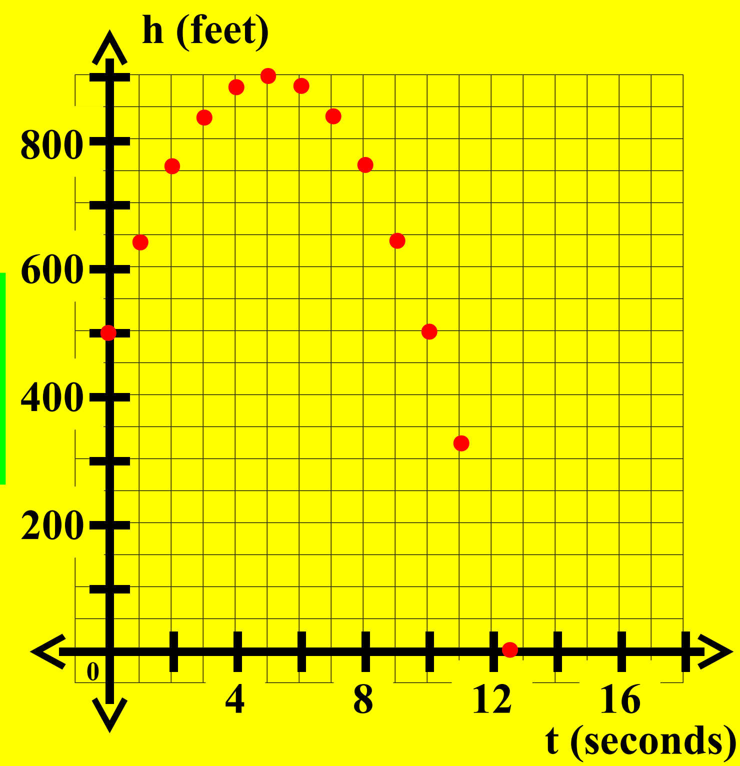

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t	h
0	500
1	644
2	756
3	836
4	884
5	900
6	884

t	h
7	836
8	756
9	644
10	500
11	324
12	116
12.5	0

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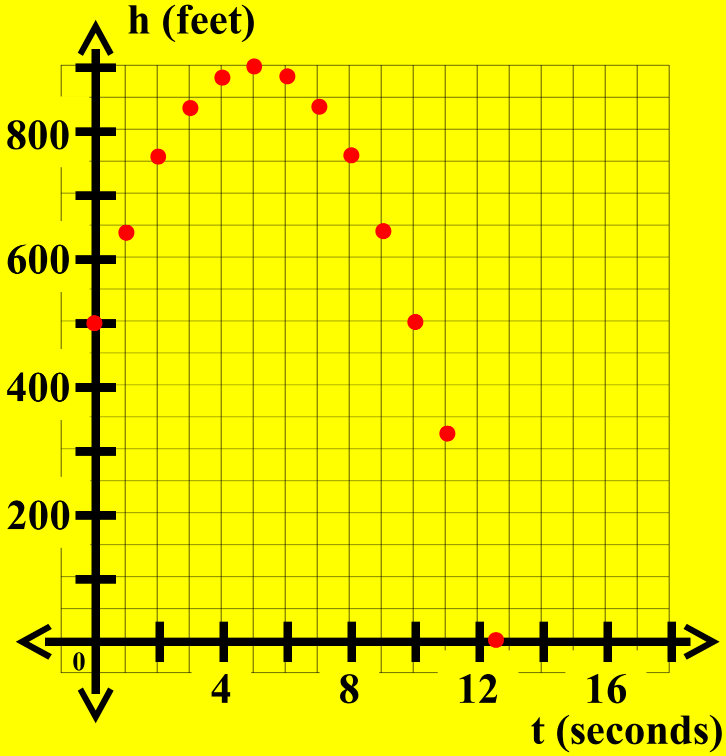

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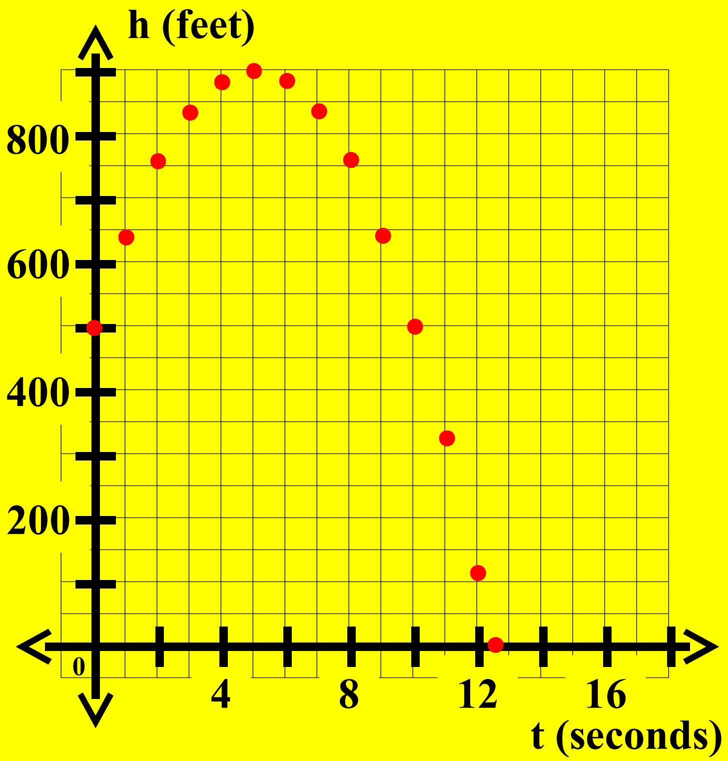

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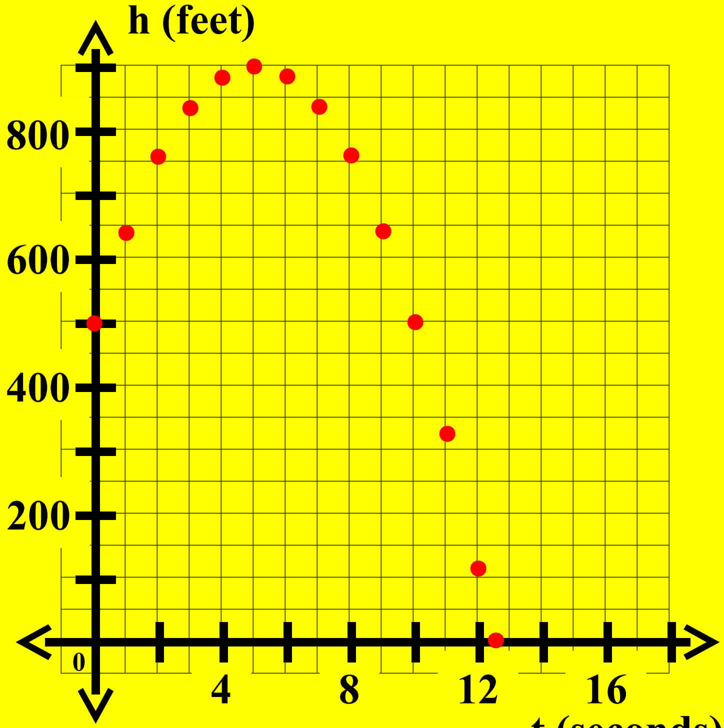

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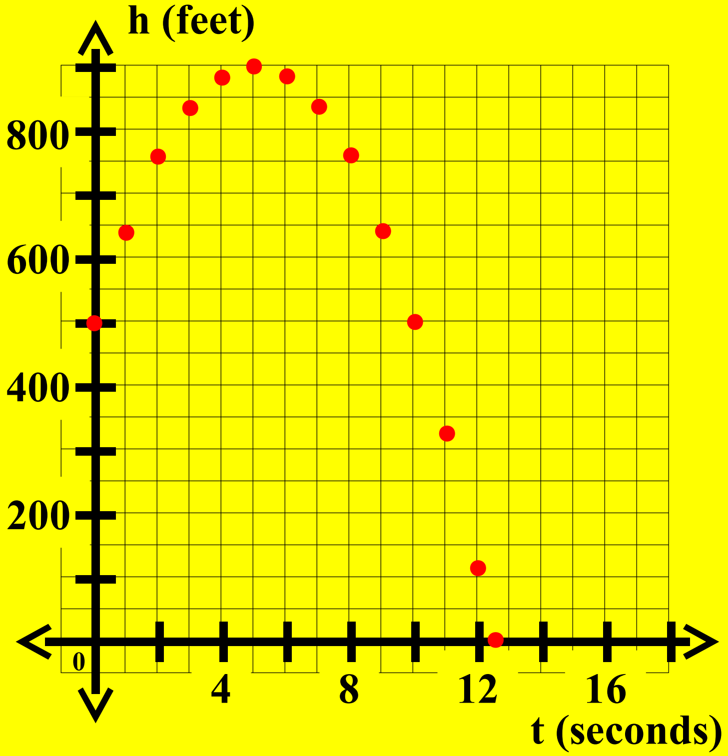

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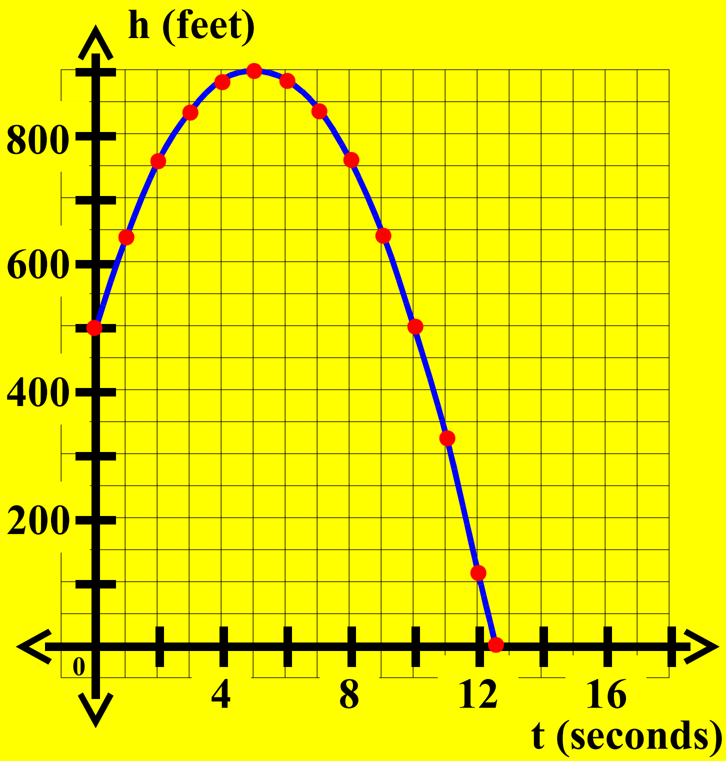

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