

10.3: Quadratic Applications

“I WILL ...

Apply problem solving skills which relate to quadratics.”

I. Quadratic Equations

- A. Quadratic Equation is $y = ax^2 + bx + c$ where a , b , and c are _____
- B. Vertex Equation: $x = -b/2a$ and plug in x to get y

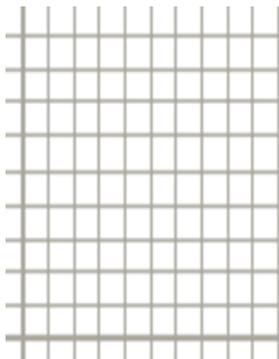
II. Quadratic Applications

- A. Read the question TWICE
- B. Understand the Question
- C. _____ key numbers and terms
- D. _____ equation using the graphing calculator
- E. When graphing, **ALWAYS** label the x and y -axis (Remember: y depends on x)
- F. _____ the points from the graphing calculator
- G. _____ the points and make the parabola
- H. Establish the _____ to determine the highest or lowest point of the graph

III. Model Problems

Ex 1: A soccer player kicked a ball whose height can be modeled by the equation, $h = -16t^2 + 128t$, where h is height in feet and t is time in seconds. How long does it take for the ball to reach the ground? How high did it go and for how many seconds?

x	y
0	
1	
2	
3	
4	
5	
6	
7	
8	

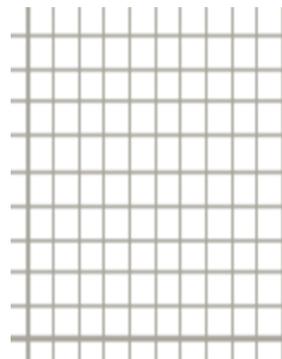


How long does it take? _____

How high does it go? _____

Ex 2: Scott shot his algebra book using a giant slingshot. The path of the book can be modeled by the function $h = -16t^2 + 96t$ where h is the height and t is time. Graph the function. How long does it take for the book to reach the ground? How high did it go and for how many seconds?

x	y
0	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

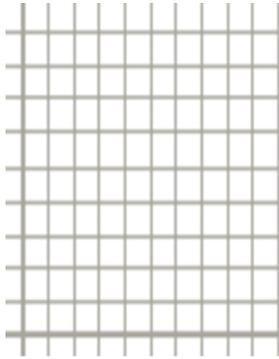


How long does it take? _____

How high does it go? _____

Your Turn: James was playing basketball where he was trying to make a three-pointer. The path of the ball can be modeled by the function, $h = -16t^2 + 96t$ where h is the height and t is time. Graph the function. How long does it take for the ball to reach the ground? How high did it go and at for how many seconds?

x	y
0	
1	
2	
3	
4	
5	
6	



How long does it take? _____
 How high does it go? _____

Ex 5: During practice, a hockey player was hitting the puck whereas the height can be modeled by the equation, $h = -16t^2 + 144t$, where h is height in feet and t is time in seconds. How high did it go and for how many seconds?

x	y
0	
1	
2	
3	
4	
5	
6	
7	
8	
9	

Ex 3: Given the equation, $y = 4x^2 + 5x - 8$, identify A , B , and C .

Ex 4: Given the equation, $y = -15x^2 + 31$, identify A , B , and C .

Your Turn: Given the equation, $y = -16x + 12x^2 + 9$, identify A , B , and C .

Ex 6: During practice, a softball pitcher throws a ball whose height can be modeled by the equation, $h = -16t^2 + 24t + 1$, where h is height in feet and t is time in seconds. How high did it go and for how many seconds?

Your Turn: An athlete throws a shot put with an initial velocity of 40 feet per second. The equation that models the height is as follows: $h = -16t^2 + 40t + 6.5$, where h is height in feet and t is time in seconds. How high did it go and for how many seconds?