Steps for solving stories:
1. READ the story, write down the information needed and define a variable
2. Write an equation
3. Solve for variable
4. Check

Tips for solving story problems:
- Identify what you know.
- What are you trying to find out?
- Draw a picture or diagram to help you visualize the situation.
- Carefully define your variables.
- Translate the words into symbols.
- Use appropriate units.
- Make sure your answer makes sense.

Hints:
- *Sum: +   Difference: –   Product: ×   Quotient: ÷*

- ★ _**Words that tell you to look for the vertex:**_ maximum, minimum, highest, lowest, biggest, littlest, largest, smallest, maximize, minimize.

EXAMPLES:
1. A ski club sells calendars to raise money. The profit, P, in dollars, from selling x calendars is given by the equation $P(x) = 120x - x^2$.

Define your variables: $x =$ _____, $P(x) = y =$ _____

Sketch a graph of the situation. Label the axes clearly.

How much profit will the club make from selling 50 calendars?

How many calendars must be sold for the club to make $2700?

How many calendars must be sold to maximize profit?

What is the maximum profit?

2. A rock is thrown upward from the ground by the wheel of a truck. Its height in feet above the ground after t seconds is given by the function $h(t) = -16t^2 + 20t$.

Define your variables: $x = t =$ _____, $h(t) = y =$ _____

Draw a sketch of the graph representing the path of the height of the rock. Label your axes.

How long does it take the rock to reach its maximum height?

What is the maximum height of the rock?

How long will it take for the rock to return to the ground?

3. A penny is thrown upward from the observation deck on the 102nd floor of the Empire State Building. It's height, h, in feet, after t seconds is given by the equation $h(t) = -16t^2 + 92t + 1250$

Define your variables: $x = t = $ _____ , $h(t) = y = $ _____

Draw a sketch of the graph representing the path of the height of the penny. Label your axes.

What is the height of the observation deck? (In other words, how high is the penny at $t = 0$?)

How high is the penny after 2 seconds?

The Empire State Building has a lightning rod with a tip that is 1454 ft above the ground. Will the penny reach the top of the lightning rod? (Hint: Find the maximum height and see if it's larger or smaller than 1454 ft.)

When will the penny be 1110 feet above the ground?

How long will it take for the penny to hit the ground?

4. The cost C, in dollars, of manufacturing x bikes per week at a production plant is given by the function $C(x) = 2x^2 - 800x + 92,000$.

Define your variables: $x = $ _____ , $C(x) = y = $ _____

Sketch a rough graph of the cost equation. Be sure to label your axes. Use the y-intercept and the direction of opening to help draw the graph.

How much does it cost to manufacture 50 bikes per week? Show your work.

Find the number of bikes that must be manufactured each week to minimize the cost. Show your work.

Find the minimum cost. Show your work.