

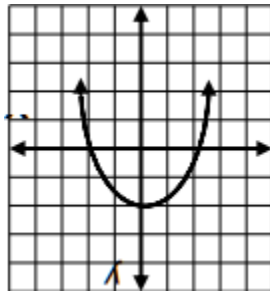
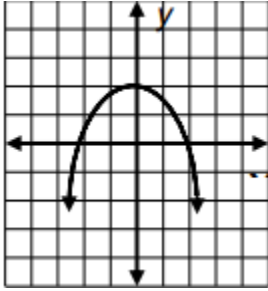
Aim: How can we solve numerical verbal problems leading to a quadratic equation?

Do Now:

1. What is an equation of the axis of symmetry of the parabola represented by  $y = -x^2 + 6x - 4$ ?
2. What is the equation for the axis of symmetry for :  $y = -x^2 - 2x - 1$ 
  - (1)  $x = 1$
  - (2)  $x = -1$
  - (3)  $y = 1$
  - (4)  $y = -1$

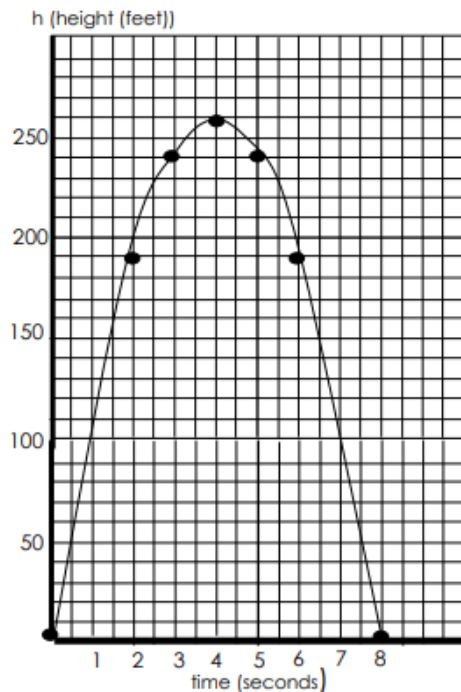
### I – Verbal Problems

1)



In a verbal problem, the turning point is usually the answer to the problem.

2) Example:



**EX. 1** Using the graph at the right, It shows the **height  $h$**  in feet of a small rocket  **$t$  seconds** after it is launched. The path of the rocket is given by the equation:  
 **$h = -16t^2 + 128t$ .**

1. How long is the rocket in the air? \_\_\_\_\_
2. What is the greatest height the rocket reaches? \_\_\_\_\_
3. About how high is the rocket after 1 second? \_\_\_\_\_
4. After 2 seconds,  
about how high is the rocket? \_\_\_\_\_  
is the rocket going up or going down? \_\_\_\_\_
5. After 6 seconds,  
about how high is the rocket? \_\_\_\_\_  
is the rocket going up or going down? \_\_\_\_\_

Aim: How can we solve numerical verbal problems leading to a quadratic equation?

3) Try it on your own:

After  $t$  seconds, a ball tossed in the air from the ground level reaches a height of  $h$  feet given by the function  $h(t) = 144t - 16t^2$ .

a. What is the height of the ball after 3 seconds?

b. What is the maximum height the ball will reach?

c. After how many seconds will the ball hit the ground before rebound?

4) A rock is thrown from the top of a tall building. The distance, in feet, between the rock and the ground  $t$  seconds after it is thrown is given by  $d(t) = -16t^2 - 4t + 382$ . How long after the rock is thrown is it 370 feet from the ground?

Aim: How can we solve numerical verbal problems leading to a quadratic equation?

**HW #5**

Name \_\_\_\_\_  
Date: \_\_\_\_\_

MES44QC-Homework 5  
Mr. Pineda

1.

Factor the expression  $x^4 + 6x^2 - 7$  completely.

2.

John and Sarah are each saving money for a car. The total amount of money John will save is given by the function  $f(x) = 60 + 5x$ . The total amount of money Sarah will save is given by the function  $g(x) = x^2 + 46$ . After how many weeks,  $x$ , will they have the same amount of money saved? Explain how you arrived at your answer.

3.

The height,  $H$ , in feet, of an object dropped from the top of a building after  $t$  seconds is given by  $H(t) = -16t^2 + 144$ .

How many feet did the object fall between one and two seconds after it was dropped?

4.

A school is building a rectangular soccer field that has an area of 6000 square yards. The soccer field must be 40 yards longer than its width. Determine algebraically the dimensions of the soccer field, in yards.

Determine, algebraically, how many seconds it will take for the object to reach the ground.

5.

A toy rocket is launched from the ground straight upward. The height of the rocket above the ground, in feet, is given by the equation  $h(t) = -16t^2 + 64t$ , where  $t$  is the time in seconds.

Determine the domain for this function in the given context. Explain your reasoning.

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### Answers to HW # 5

Please select the correct answer number for each question. There are more answer than questions. Answers may be repeated.

- 1) 7
- 2) 3
- 3) 9
- 4)  $(x^2+7)(x^2-1)$
- 5) -100
- 6) 60
- 7)  $(x^2+7)(x+1)(x-1)$
- 8) 4
- 9) 0
- 10) 48