

### Example 3 Quadratic Application with Equation Given

A water arch at a splash pad is defined by the following function:

$$V = -0.15x^2 + 3x$$

Where  $x$  represents the horizontal distance, in feet, from the opening in the ground, and  $V$  represents the vertical distance, in feet.



- a) What is the maximum height of the arch of the water?

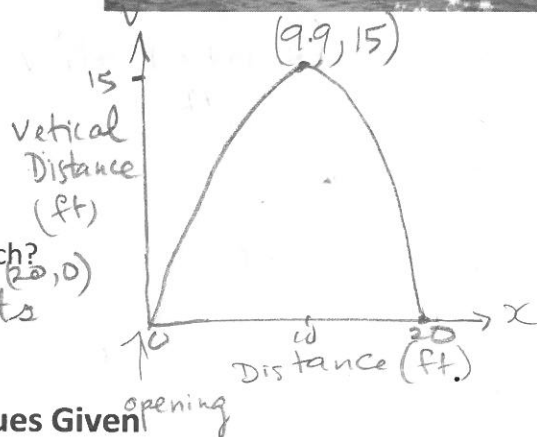
Find the vertex.  
y-value is the max. height.

15 feet

- b) How far from the opening in the ground can the water reach?

Find the two x-intercepts  $(0,0)$  and  $(20,0)$   
The difference between the x-intercepts

= 20 feet



### Example 4: Quadratic Application with Table of Values Given

- a) An archway is parabolic in shape. Some measurements taken from the archway are shown in the table below. Determine the quadratic regression equation.

$$y = -0.98x^2 + 6.25x - 0.0015$$

x	<b>Horizontal Distance (ft)</b>	0	2	4	6
y	<b>Height (ft)</b>	0	8.59	9.38	2.34

L1  
L2



- b) What is the maximum height of the archway?

Vertex  $(3.19 \text{ ft}, 9.96 \text{ ft})$

Maximum height = 9.96 feet

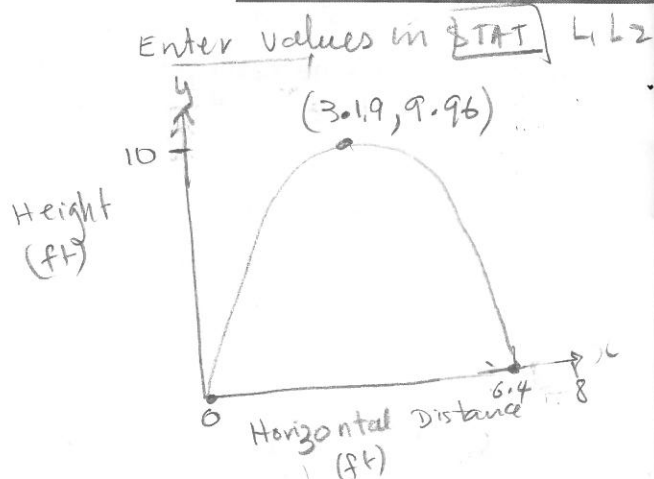
- c) What is the minimum height?

0 ft

- d) How wide is the archway at ground level?

Find the 2 x-intercepts  
 $(0,0)$  and  $(6.4,0)$

width is 6.4 m



$$y = -0.98x^2 + 6.25x - 0.0015$$