# Lesson 3.2.2

Saturday, February 4, 2017 4:39 PM

**PREC 11** **3.2 (cont.) Analyzing a Quadratic Function**

Quadratic functions can be applied to real situations (eg. Projectile motion). It also occurs in a situation where a quantity is the product of two other quantities, one increasing and one decreasing.

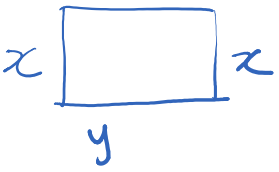
**Example 1:** There are 40 m of fencing to enclose a rectangular pen.

a. Represent the area of the pen as a function of the length of one side of the pen.

$y = 20 - x$ → $2x + 2y = 40$

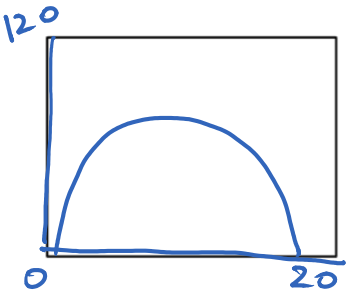
$2y = 40 - 2x$

$y = 20 - x$




$\text{Area} = l \cdot w = x(20 - x) = 20x - x^2$

b. Graph the function.




Window

$x: [0, 20, 1]$

$y: [0, 120, 1]$

min max scale

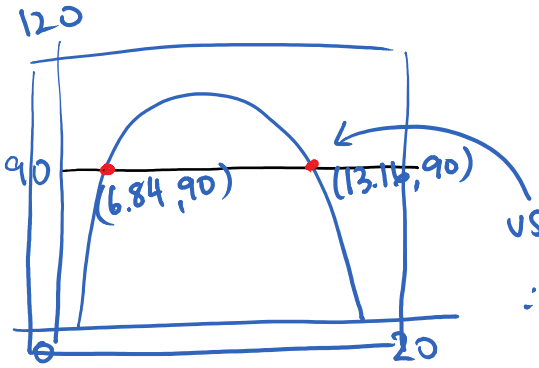
* Must give the window

c. What dimensions provide an area greater than $90\ m^2$?

Area $90\ m^2$ → $y = 20x - x^2$

$y_1 = 20x - x^2$

$y_2 = 90$



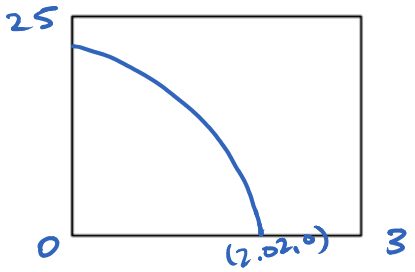

use CALC : 5 : Intersect.

∴ when width is between 6.84m and 13.16m, the area is greater than $90m^2$.

**Example 2:** A stone is dropped from a bridge over the Peace River. The height of the stone, $h$ metres, above the river, $t$ seconds after it was dropped, is modeled by $h = 20 - 4.9t^2$. → graph on calc: $y = 20 - 4.9x^2$

a. Graph the function.

height ↑ seconds ↑




b. When did the stone hit the river?

hits river when height is zero.
(when $y = 0$ ⇒ find x-int.)

Calc 2: zero

$x = 2.02$

∴ hits water at 2.02 seconds.

c. What is the domain? What does it represent?

On calculator domain is $\in \mathbb{R}$

BUT in this situation we have specific domain

∴ Domain: $0 \leq t \leq 2.02$

Assignment: pg. 175 #7, 9, 11, 12, 14, 17, ~~26~~ 22, 23

P. 177 #16 Discuss