

**Sec 4.4 - 4.5:**  
**Optimization & Linearization**

Kristen needs to enclose a rectangular pen for her cows. Kristen only has 800 feet of fencing material so she will use the 60 foot side of a barn as part of one side of the fence. Find the largest possible area of the pen and the dimensions that will produce this area.

A rectangle is bounded by the  $x$ -axis and the  $y$ -axis with a vertex on line  $p$  as shown. What is the maximum area of the rectangle and what are the dimensions of this rectangle?

For  $f(x) = .2x^4$  find an equation of the linear function that best fits  $f$  at  $x=3$ .

Use the tangent line you found to approximate  $f(3.001)$ .

For  $f(x)=(1+\tan x)^{3/2}$  find an equation of the linear function that best fits  $f$  at  $x=0$ .

Use the tangent line you found to approximate  $f(0.02)$ .