# Animal Pen Problem

$180 = 5 \cdot 2y + 5 \cdot x + x$

$\qquad = 10y + 6x \Rightarrow x = 30 - \frac{10}{6}y \geq 0 \Rightarrow y \leq 18$

$A(x,y) = xy$

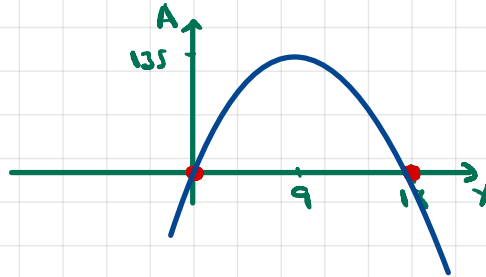$\qquad A(y) = y\left(30 - \frac{10}{6}y\right) = 30y - \frac{5y^2}{3}, \quad y \in [0,18]$

$A'(y) = 30 - (10/3)y = 0$

$\qquad 10y = 90 \Rightarrow y = 9$

$\qquad\qquad \Rightarrow x = 15$

$A''(y) = -\frac{10}{3}$



# Ex 9

$A(x,y) = xy$

$A(x) = x\left(18 - \frac{3}{5}x\right), \quad x \in [0,30]$

$x \geq 0$

$y = 18 - \frac{3}{5}x \geq 0 \Rightarrow x \leq 30$