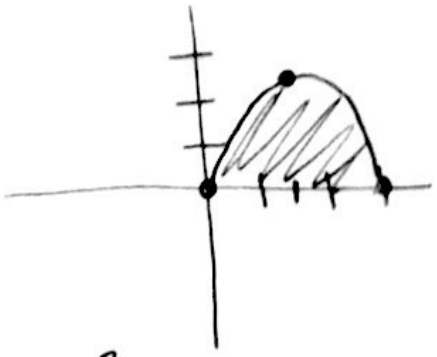
7) Area bounded by $y = -x^2 + 3x$ and x-axis. *



$y = x(-x + 3)$

$0 = x(-x + 3)$

$x = 0 \quad x = 3$

vertex

$\frac{-b}{2a} = \frac{-3}{2(-1)} = \left(\frac{3}{2}, \frac{9}{4}\right)$

$-\left(\frac{3}{2}\right)^2 + 3\left(\frac{3}{2}\right)$

$-\frac{9}{4} + \frac{9}{2} = \frac{9}{4}$

$$A = \int_0^3 (-x^2 + 3x)\,dx$$

$$= -\frac{x^3}{3} + \frac{3x^2}{2}\Big|_0^3$$

$$= \left[-\frac{(3)^3}{3} + \frac{3(3)^2}{2}\right] - 0$$

$$= -\frac{27}{3} + \frac{27}{2}$$

$$= -9 + \frac{27}{2}$$

$$= \frac{9}{2} \text{ units}^2$$