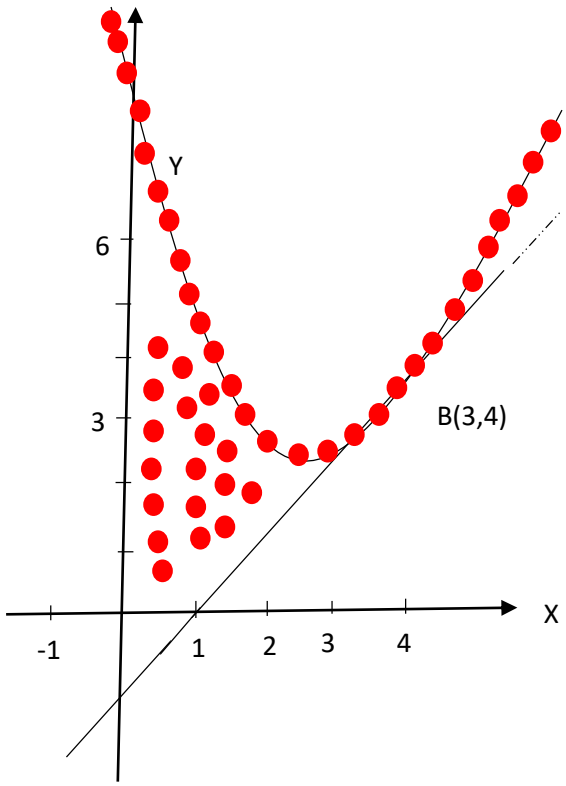
Parabola and Tanget



Parabola $y = (x - 2)^2 + 3$

$y = x^2 - 4x + 7$

$x = 3 \Rightarrow y = (3-2)^2 + 3 = 4$

$y = x^2 - 4x + 7$

$y^{I} = 2x - 4$

$y^{I}(x=3) = 2.3 - 4 = 2$

B(3,4) $a = 2 \Rightarrow$ The tanget line (equation)

$y - 4 = 2(x - 3)$

$y = 2x - 2$

$$\int_0^3 (x^2 - 4x + 7 - 2x + 2)dx =$$

$$\int_0^3 (x^2 - 6x + 9)dx = \int_0^3 (x-3)^2 dx = \left.\frac{(x-3)^3}{3}\right]_0^3 = 0 - (-9) = 9$$

Example II

$y = x^2 + 2$ $\quad x = 2$, $B_1(2,6)$

$y^{I} = 2x$

$y^{I}(2) = 4 \Rightarrow (2,6)$ $\quad a = 4$ $\quad y - 6 = 4(x - 2) \Rightarrow y = 4x - 2$

$$\int_0^2 (x^2 - 4x + 4)dx = \int_0^2 ((x-2)^2 dx =$$

$$= \left.\frac{1}{3}(x-2)^3\right]_0^2 = \frac{8}{3}$$