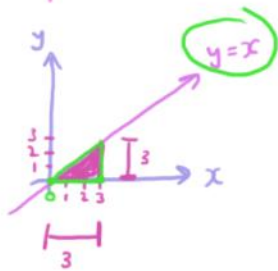
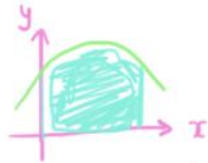


# Integration lesson 4

Wednesday, December 18, 2013

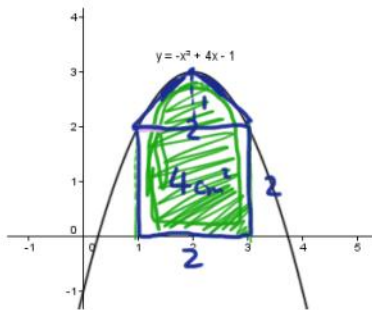
5:44 AM

How to find the area under a curve using Integration



$$\begin{aligned}\text{Area of a triangle} &= \frac{b \times h}{2} \\ &= \frac{3 \times 3}{2} \\ &= \frac{9}{2} \\ &= 4.5\end{aligned}$$

$$\begin{aligned}\int_0^3 x \, dx &= \left[ \frac{x^2}{2} \right]_0^3 \\ &= \left[ \frac{3^2}{2} \right] - \left[ \frac{0^2}{2} \right] \\ &= \frac{9}{2} - 0 \\ &= 4.5\end{aligned}$$



$$\begin{aligned}\int_1^3 -x^2 + 4x - 1 \, dx \\ &= \left[ -\frac{x^3}{3} + \frac{4x^2}{2} - x \right]_1^3 \\ &= \left[ -\frac{3^3}{3} + \frac{4 \times 3^2}{2} - 3 \right] - \left[ -\frac{1^3}{3} + \frac{4 \times 1^2}{2} - 1 \right] \\ &= \left[ -\frac{27}{3} + \frac{36}{2} - 3 \right] - \left[ -\frac{1}{3} + \frac{4}{2} - 1 \right] \\ &= \left[ -9 + 18 - 3 \right] - \left[ \frac{2}{3} \right] \\ &= 6 - \frac{2}{3} = 5 \frac{1}{3}\end{aligned}$$