Integration lesson 5

Wednesday, December 18, 2013
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Finding the area under the curve part 2
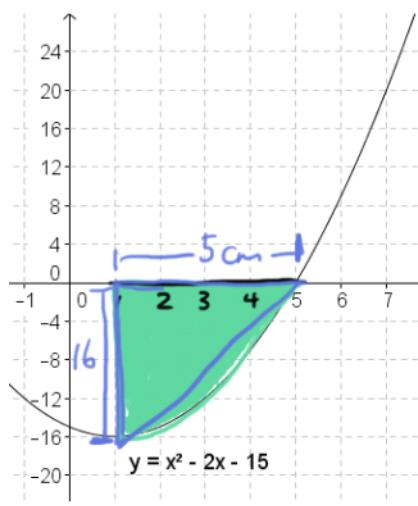
y = x² - 2x - 15

Area under the curve = area bounded by the line and the x axis

$$\int_1^5 x^2 - 2x - 15 \, dx$$

$$= \left[\frac{x^3}{3} - \frac{2x^2}{2} - 15x \right]_1^5$$

$$= \left[\frac{5^3}{3} - \frac{2 \times 5^2}{2} - 15 \times 5 \right] - \left[\frac{1^3}{3} - \frac{2}{2} - 15 \right]$$

$$= -58\frac{1}{3} - -15\frac{2}{3}$$

$$= -42\frac{2}{3}$$

The area is $42\frac{2}{3}$ units².

check:
$$\triangle \text{ area} = \frac{b \times h}{2}$$
$$= \frac{5 \times 16}{2}$$
$$= 40$$