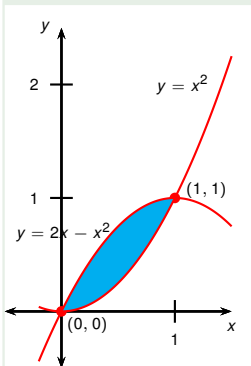# Calculus I
Area between two parabolas, part 2

Todor Milev

2019

Example

Find the area of the region enclosed by the parabolas $y = x^2$ and $y = 2x - x^2$.

$$x^2 = 2x - x^2$$

$$0 = 2x - 2x^2 = 2x(1 - x)$$

$$x = 0 \text{ or } 1.$$

$$A = \int_0^1 (2x - 2x^2)\mathrm{d}x = 2\int_0^1 (x - x^2)\mathrm{d}x$$

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

1. Find the point of intersection.
2. Graph the functions.
3. Identify the region.
4. Integrate.

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