

Area Between 2 Curves

Example #1: Find the area of the region bounded by the y-axis, $y = x^2 - 2$ and $y = -x + 4$ (in the 1st and 4th quadrant)

Graph:

1. Find all intersection points.

2. Compute area.

$$A = \int_a^b \left(\begin{array}{c} \text{upper} \\ \text{function} \end{array} \right) - \left(\begin{array}{c} \text{lower} \\ \text{function} \end{array} \right) dx, \quad a \leq x \leq b$$

Lesson #54, 55, 56

Example #2: Find the area of the region enclosed by $y = x^2$ and $y = x + 6$.

Example #3: Find the area of the region bounded by $x = y^2$ and $y = x - 2$.

$$A = \int_c^d \left(\begin{array}{c} \text{right} \\ \text{function} \end{array} \right) - \left(\begin{array}{c} \text{left} \\ \text{function} \end{array} \right) dy, \quad c \leq y \leq d$$

Lesson #54, 55, 56

Example #4:

Find the area enclosed by $y = x^3$, $y = -x$, and $y = 8$.

Example #5:

Find the area between $y = 1 + |x - 2|$ and $y = 3$.

Lesson #54, 55, 56

Example # 6:

Find the area bounded by $y = \sin x$, $y = \cos x$, $x = 0$, and $x = \frac{\pi}{2}$.