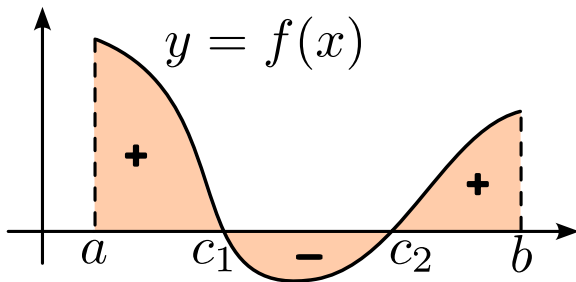


Integration: Applications

Introduction to Engineering Mathematics

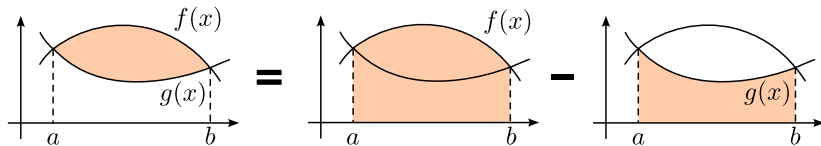
Prof. Joris Vankerschaver

Reminder: area under the curve



$$\text{Area} = \int_a^{c_1} f(x)dx - \int_{c_1}^{c_2} f(x)dx + \int_{c_2}^b f(x)dx.$$

Area between two curves



Recipe for finding the area

- ① Make a figure
- ② Determine intersection points
- ③ Figure out which curve is upper/lower
- ④ Integrate

Example

Find the area bounded by $y = \sin x$, $y = 0$, and $x = \frac{3\pi}{2}$.

Example

Find the area of the region between the curves $y = x^2 - 2x$ and $y = 4 - x^2$.

Example

Find the area of the region between $x = 12 - y^2$ and $y = -x$.