

Area between curves

Chase Mathison¹

Shenandoah University

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¹cmathiso@su.edu

Announcements

- 1 Stay up to date on homework!
- 2 Office hours: M - F, 10am - 11am.

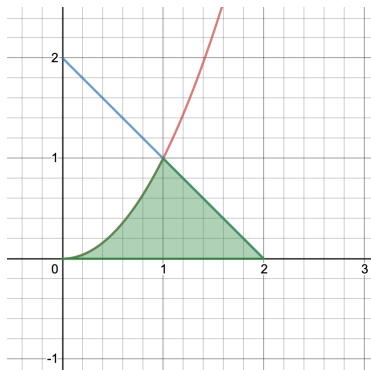
Another way

Let's look at a different way to do this problem:

Find the area bounded by the curves defined by the functions

$$f(x) = x^2, \quad g(x) = 2 - x, \quad h(x) = 0.$$

for $0 \leq x \leq 2$.



Another way

To find this area last time, we had to break this area into 2 pieces and then find the areas separately.

A way to tackle this problem all at once is to instead switch to integrating in terms of _____ instead of in terms of x .

When we do this, instead of a “top” curve and a “bottom” curve, we are really looking at a _____ curve and a _____ curve.

Let's try to tackle this area by integrating in terms of y instead of x .

Example

Find the area bounded by the curves defined by the functions

$$f(x) = x^2, \quad g(x) = 2 - x, \quad h(x) = 0.$$

for $0 \leq x \leq 2$, by integrating with respect to the dependent variable instead of the independent variable.

Example

How it works in general

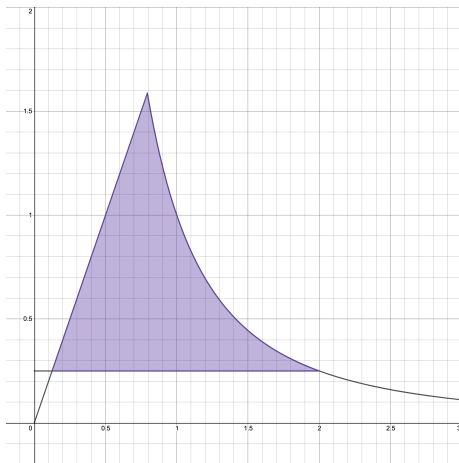
In general, if we want to find the area bounded by two functions of y , we can use the “little slice” method as follows:

How it works in general

Example

Find the area of the region bounded by the curves

$$y = \frac{1}{x^2}, y = 2x, y = 2.$$



Example