

## Area of Region Between Two Curves

Goal: Find the area of a region bounded between two curves.

$$\text{Area between } f \text{ and } g = \int_a^b f(x) - g(x) dx$$

$$= \int_a^b f(x) dx - \int_a^b g(x) dx$$

- Region between two intersecting graphs

\*You have to find the limits of integration.

How? – Set  $f$  and  $g$  equal to each other and solve.

Ex:

$$f(x) = x^3 + 2, g(x) = x + 1$$

$$x = 0, 2$$

CAUTION: Make sure you put the correct curve on top.

Ex:

$$f(x) = -x^2 + 4x + 2 \text{ and } g(x) = x + 2$$

- If your curve intersects at more than one place, you may need two or more integrals.

Ex:  $f(x) = 3(x^3 - x)$  and  $g(x) = 0$

\*For each integral, make sure the correct curve is on top.