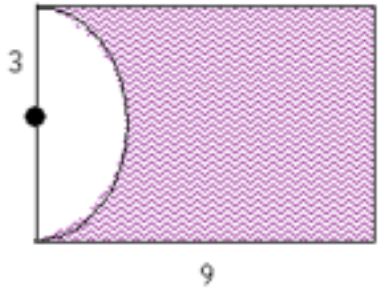
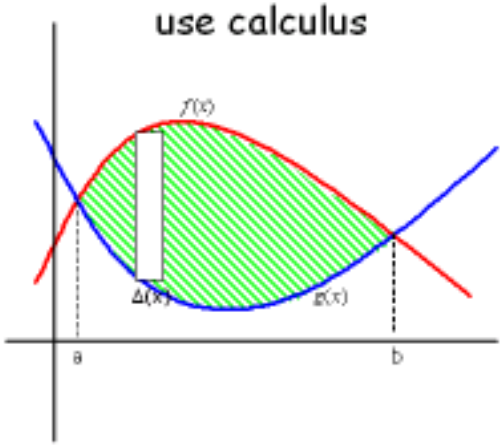
Sec 7.2:
Areas in a Plane

How could you find the area of the shaded regions below?

use geometry



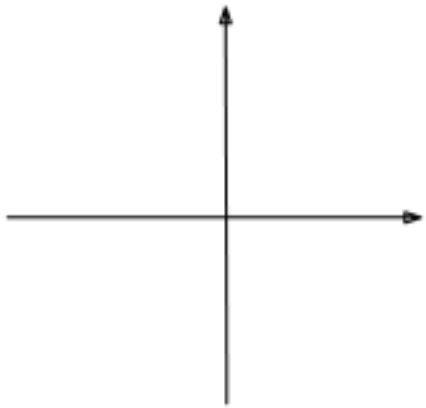
use calculus



$$A = \int_a^b \left[(\text{topcurve}) - (\text{bottom curve}) \right] dx$$

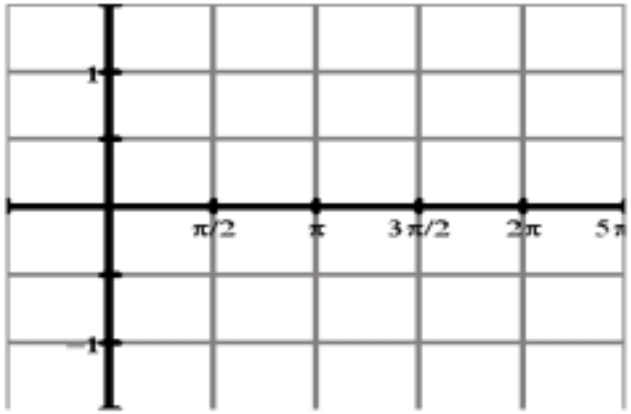
Sketch a graph and find the area (without a calc) of the region bounded by the functions below.

$f(x) = 2 - x^2$ $\qquad$ $g(x) = x$



Sketch a graph and find the area (without a calc) of the region bounded by the functions below.

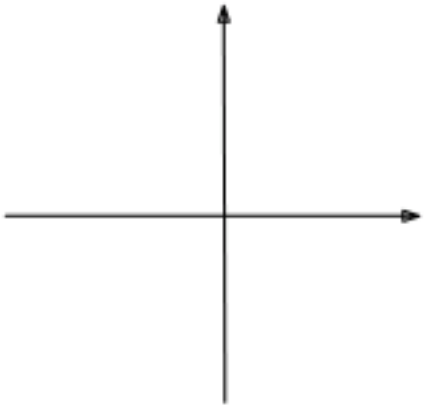
$f(x) = \sin x$ $\quad$ $g(x) = \cos x$ $\quad$ $\frac{\pi}{4} \le x \le \frac{5\pi}{4}$



If the functions switch postitions, then you must split the integral up into different regions.

Sketch a graph and find the area (use your calc) of the region bounded by the functions below.

$$f(x) = 3x^3 - x^2 - 10x \qquad g(x) = -x^2 + 2x$$



Sometimes it is easier or necessary to look at the are horizontally. In that case, we just put everything in terms of y.

$$A = \int_a^b \left[(\text{right curve}) - (\text{left curve})\right] dy$$

Sketch a graph and find the area of the region bounded by the functions below.

$$x = 3 - y^2 \qquad y = x - 1$$