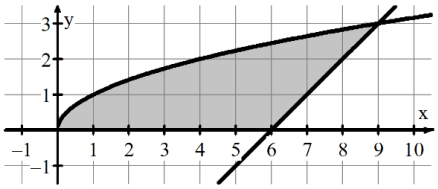
Calculus

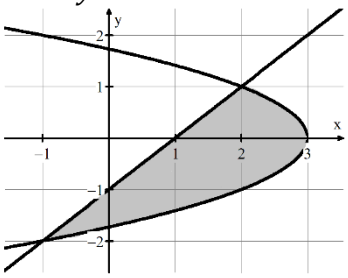
Write your questions and thoughts here!

8.5 Area Between Curves (with respect to y) Notes

1. Set up the integral that allows you to find the area in the first quadrant that is bounded above by $y = \sqrt{x}$ and below by $y = x - 6$.



2. Set up the integral to find the area bounded by $x = 3 - y^2$ and $x = y + 1$.



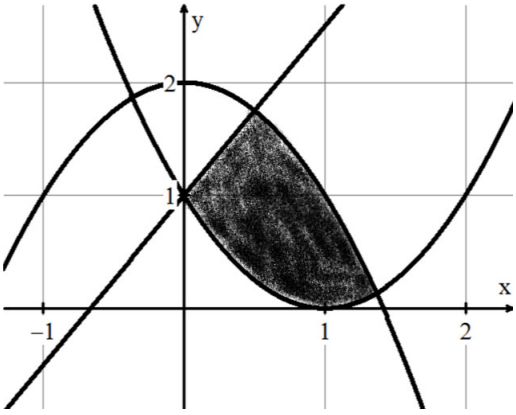
3. An area can be represented by an integral with respect x or an integral with respect to y.

With respect to $\boldsymbol{x}$.

Use a calculator to find intersection points!

$y = 2 - x^2,\ \ y = (x-1)^2,\ \ y = \frac{3}{2}x + 1$

With respect to $\boldsymbol{y}$.



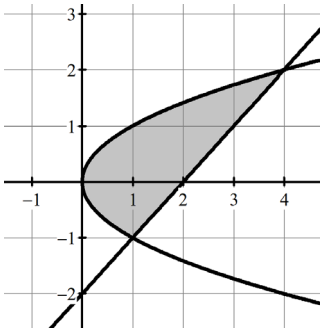
8.5 Area Between Curves (with respect to y)

Calculus

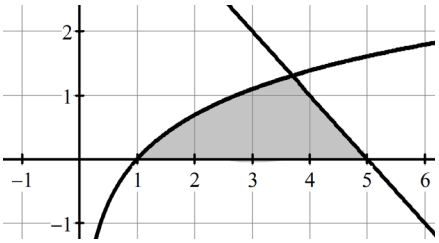
Practice

For each region, set up an integral **with respect to y** that represents the area of the region. Do not solve.

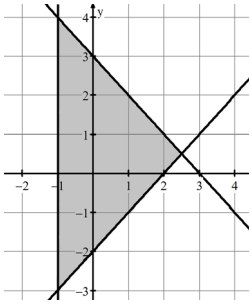
1. $x = y^2,\ x = y + 2$



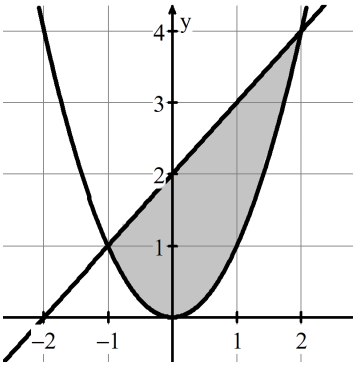
2. $y = \ln x,\ y = 5 - x, y = 0$



3. $y = -x + 3,\ y = x - 2$, and $x = -1$



4. $y = x^2,\ y = x + 2$



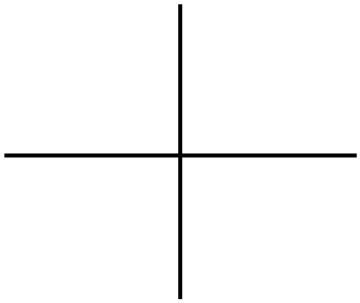
Set up the integral(s) that give the area of the region bounded by the given equations. Show the equivalent set up with respect to x as well as with respect to y.

5. $y = \sqrt{x}, x = 0$ and $y = x - 2$

with respect to x

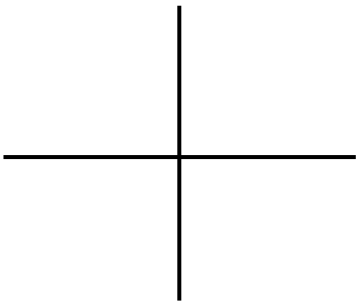
Sketch a graph here in the middle!

with respect to y



6. $y = x^2, y = 5, x = -2, x = 1$ *Sketch* a graph here in the middle!

with respect to x with respect to y



Find the area of the region bounded by the following curves. Set up your integrals with respect to y. A calculator is allowed to evaluate the integral.

7. $x = y^2 - 4,\ x = -3y$

8. $y = x,\ y = 2 - x,\ y = 0$

8.5 Area Between Curves (with respect to y)

Test Prep

9. Solve the following WITHOUT the help of a calculator. Let R be the region bounded by the graphs of $y = \sqrt{x}$ on top and $y = \frac{4}{\pi}\sin^{-1}\left(\frac{x}{4}\right)$ and on bottom, as shown in the figure. What is the area of the region? (hint: integrating with respect to y is easier than with respect to x for this problem.)