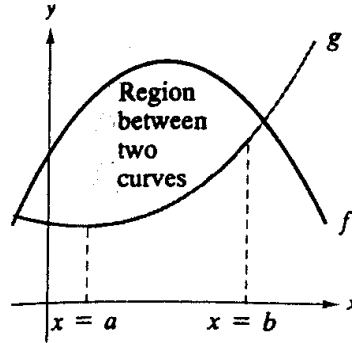


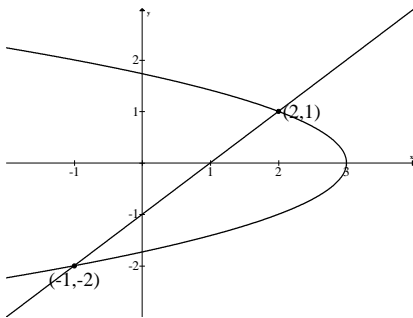
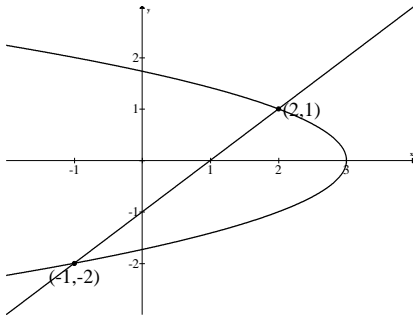
Calculus

Notes – 6.1 Area of a Region Between Two Curves

1. Use the diagram below to write an expression that could be used to find the area between the graphs of f and g on the interval $[a, b]$:



2. Find the area of the region bounded by the graphs of $y^2 = 3 - x$ and $y = x - 1$

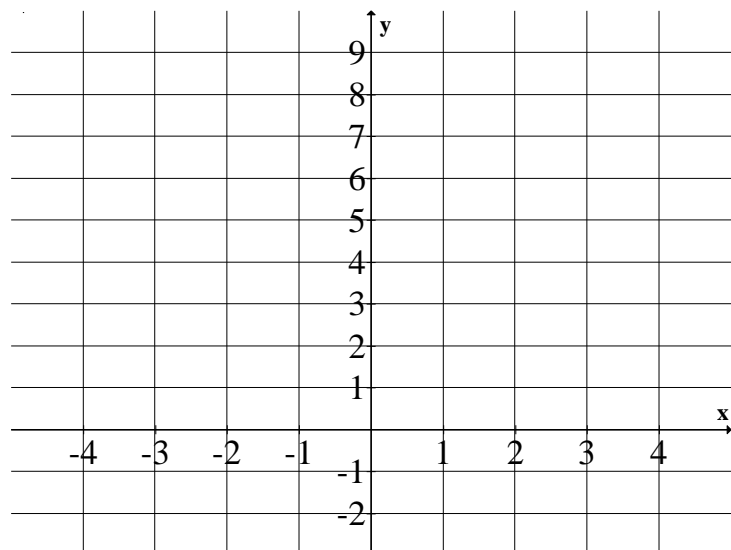


$$A = \int_{x_1}^{x_2} [(\text{Top Curve}) - (\text{Bottom Curve})] dx \quad \text{for vertical rectangles}$$

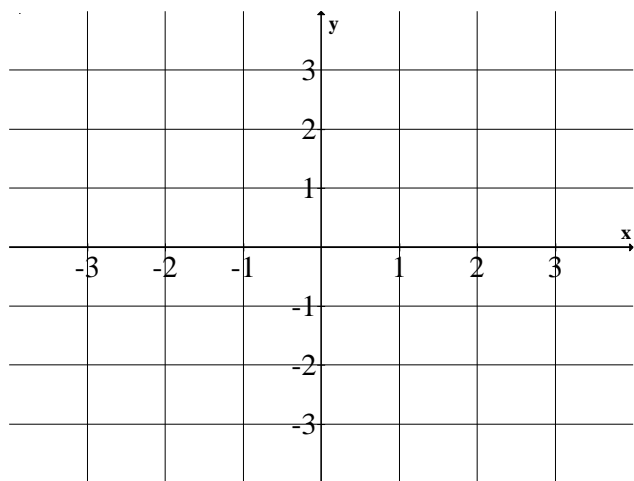
$$A = \int_{y_1}^{y_2} [(\text{Right Curve}) - (\text{Left Curve})] dy \quad \text{for horizontal rectangles}$$

Example Problems:

1. $y = x + 1$ $y = 9 - x^2$ $x = -1$ $x = 2$



2. $x + y^2 = 2$ $y + x = 0$



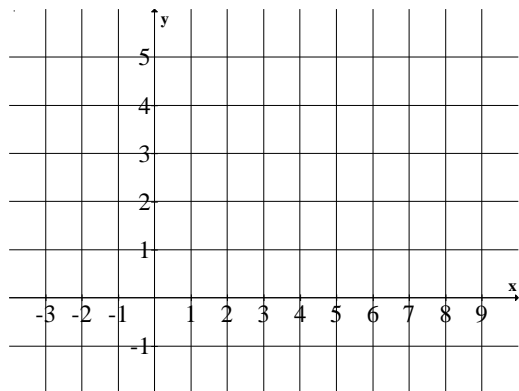
HWK: Area Between Two Curves
AB Calculus

name _____

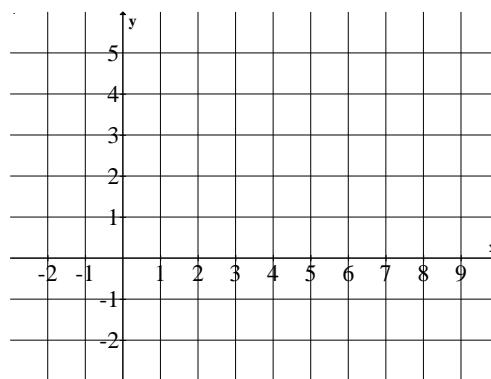
For each of the following problems:

- Sketch the region enclosed by the given curves (without a calculator).
- Decide whether to integrate with respect to x or y .
- Determine your limits of integration.
- Find the area of the region (You may use a calculator on starred problems).

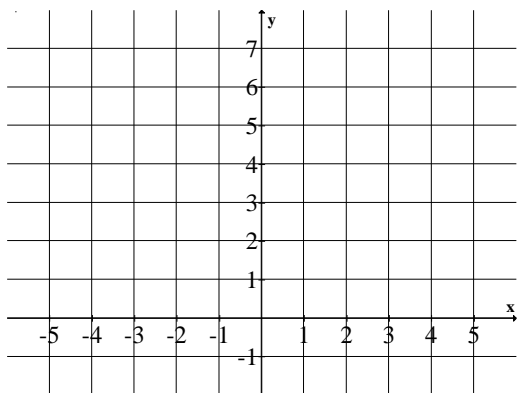
*1. $y = 1 + \sqrt{x}$ $y = \frac{3+x}{3}$



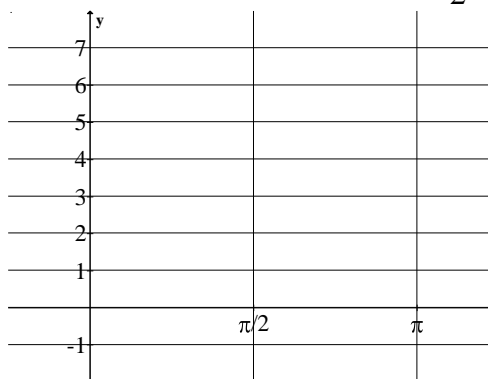
4. $y^2 = x$ $x - 2y = 3$



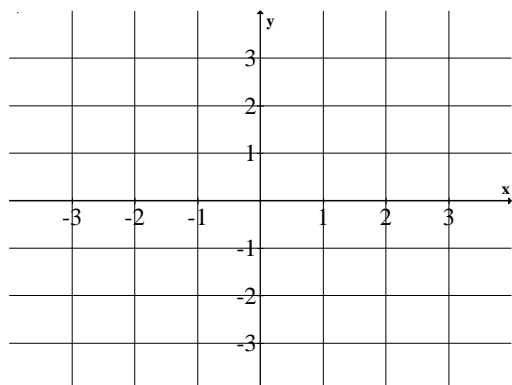
*2. $y = x^2 + 3$ $y = 4x^2$



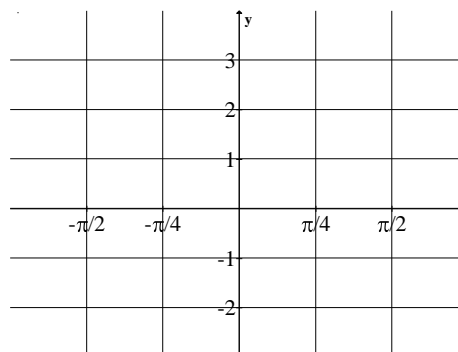
5. $y = \sin x$ $y = e^x$ $x = 0$ $x = \frac{\pi}{2}$



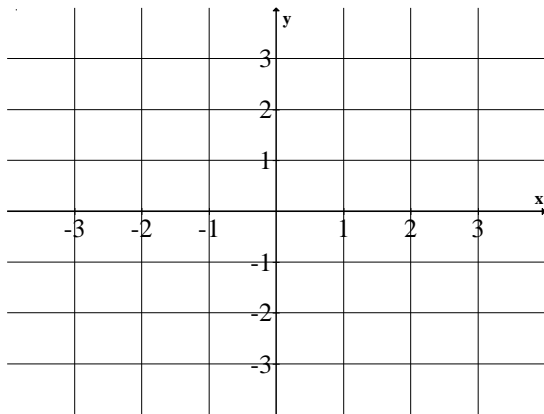
*3. $y = x^4 - x^2$ $y = 1 - x^2$



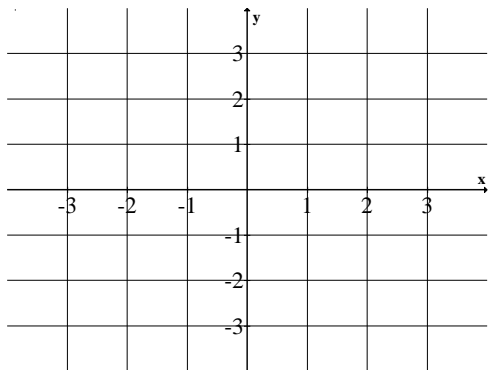
6. $y = \cos x$ $y = \sec^2 x$ $x = \frac{-\pi}{4}$ $x = \frac{\pi}{4}$



*7. $x = 1 - y^2$ $x = y^2 - 1$



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



*9. $y = |x|$ $y = x^2 - 2$

