

NAME: _____

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Worksheet week 4 - MAC 2312, Spring 2014

1. Find the area of the region bounded between the curves $x = y^2$ and $x = 2 - y$.
2. Find the area of the regions between $y = \sin x$ and $y = \sin(2x)$, for $0 \leq x \leq \pi$.
3. Use the slicing method to set up an integral that gives the volume of the solid obtained when the region in problem 1 is rotated around the line $x = 4$. You are not required to evaluate the integral, but you should sketch the solid.
4. (Volume of a sphere.) Consider the region above the x -axis bounded by the semi-circle $y = \sqrt{R^2 - x^2}$ and rotate this region around the x -axis. Use the slicing method to find the formula for the volume of the sphere of radius R . Full computation is required now.
5. (Bonus 2 pts) Find a function f and a number a such that

$$4 + \int_a^x \frac{f(t)}{t} dt = \sqrt{x}, \text{ for all } x > 0.$$