Name:_____

Notesheet. Section 8.7+8.8: Double Integrals + Geometric Applications Part 2

Math 1220

Challenge 1. Evaluate

$$\int_0^2 \int_{x^2}^4 xe^{y^2}\, dy\, dx$$

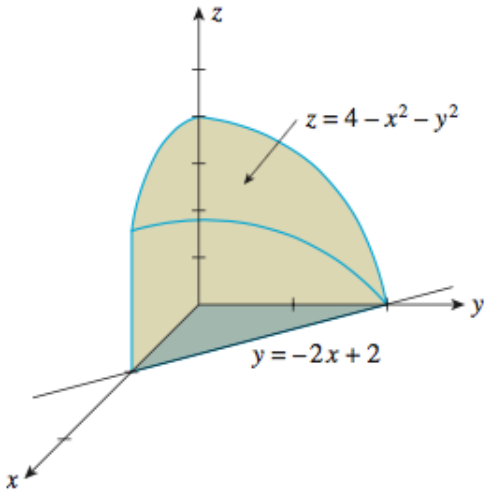
Theorem 2. If $f(x, y)$ is integrable over the plane region R, then its average value over R is given by

$$\iint_R$$

Challenge 3. Find the average value of $f(x, y) = 6x^2y$ over $R = \{(x, y) \mid 0 \leq x \leq 1; 0 \leq y \leq 3\}$.

Challenge 4. Find the average value of $f(x, y) = 6x^2y$ over R bounded by $y = 1$, $x = y$, and $x = -y$.

Challenge 5. Calculate the volume of the following solid:



Challenge 6. Setup iterated integrals for computing the double integral of a function $f(x, y)$ over the region R where R is

(a) The region bounded above by $y = \sqrt{x}$ and bounded below by $y = x$.

(b) The region bounded by the unit circle.