Section 15.3: Additional Problems

1. Set up and compute the polar integral to evaluate the following double integral where the region R is in the first quadrant and is bounded by $x^2 + y^2 = 25$, $x^2 + y^2 = 4$, $y = x$ and $y = 0$.

   $$\iint_R x\ dA$$

2. Should this integral be computed converting it to a polar integral?

   $$\iint_D y\ dA \text{ where } D = \{(x, y)|y \geq x^2, \quad x^2 + y^2 \leq 4\}$$

3. Set up the integral that will compute the following integral over the region on the $xy-$plane that is inside both of the circles: $x^2 + y^2 = 4x$ and $x^2 + y^2 = 8$.

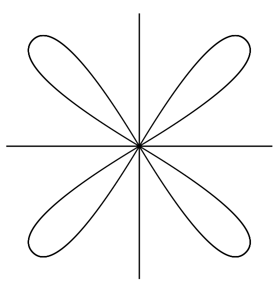
   $$\iint_D 5x + y\ dA$$

4. Set up the integral that will compute the following integral over the region on the $xy-$plane that is inside the circle $x^2 + y^2 = 4x$ and outside the circle $x^2 + y^2 = 8$.

   $$\iint_D 5x + y\ dA$$

5. Setup and compute the double integral(in polar) that would give the volume of the solid bounded by the paraboloid $z = 1 + 2x^2 + 2y^2$ and the plane $z = 7$ with the condition that $x \geq 0$.

6. Set up the integral to find the volume under the function $f(x, y) = 3x^2 + y$ over the interior of one leaf of $r = \sin(2\theta)$. **Picture is not drawn to scale**



7. Set up the integral to find the volume under the function $f(x,y) = 3y^2$ over the interior of one leaf of $r = \cos(5\theta)$. **Ignore the outer circle in the graph. The computer was being helpful.**