15-2: Even more practice describing regions

For each of the four practice example below:

Draw the region and set up the bounds for a double integral both ways, bottom/top and left/right.

$$\iint_D f(x,y)dA = \int_a^b \left(\int_{BOTTOM(x)}^{TOP(x)} f(x,y) \, dy \right) dx = \int_c^d \left(\int_{LEFT(y)}^{RIGHT(y)} f(x,y) \, dx \right) dy$$

Practice Example 1: Consider the region, D, bounded by the curves $y = \sqrt{x}, x = 0, y = 3$.

Practice Example 2: Consider the region, D, bounded by the curves $y = \sqrt{x}, x = 9, y = 0$.

Practice Example 3: Consider the region, D, bounded by the curves $y = x^2, y = 2x + 3$.

Practice Example 4: Consider the region, D, in the first quadrant bounded by the curves $y = x^3, y = 4x$.

For the next two examples below:

Draw the region that goes with the given double integral, then <u>reverse the order of integration</u>.

Practice Example 5: $\int_0^3 \left(\int_{x^2}^{3x} f(x,y) \, dy \right) dx$

Practice Example 6: $\int_0^4 \left(\int_6^{2y+6} f(x,y) \, dx \right) dy$

For more practice with regions, read/watch the 15.2 and 15.3 lectures and textbook sections, attempt the homework, and practice on old second exams. This is the key skill of chapter 15 make sure you know this well.