15-2: Even more practice describing regions

For each of the four practice examples 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*, bounded by the curves $y = x^3, y = 4x$.

For more practice with this type of problems, read 15-2, see 15-2 lecture notes, attempt 15-2 homework and see any old second midterm. I also made a practice sheet about regions that I emailed out last week, check that out again.

For the two examples below:
Draw the region that goes with the given double integral, then reverse the order of integration.

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

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

For more practice with this type of problems, see my 15-2 and 15-3 review sheet (I have a matching puzzle game where you get to try to reverse integrals and match them up). You can also see a bunch of these problems in the textbook, in my lecture notes, in homework and in old exams.