427L: the change-of-variables theorem

1. Let E be the ellipse centered at $(2, 3)$, whose major axis has length 4 (parallel to the x axis) and whose minor axis has length 3 (parallel to the y axis).

   Use the change-of-variables theorem to write the integral

   $$\iint_E f(x, y)\, dA$$

   as an integral over the unit circle centered at the origin.

2. Use the change-of-variables theorem (in polar coordinates) to evaluate the integral

   $$\iint_D (x^2 + y^2)^{3/2}\, dx\, dy,$$

   where D is the disk centered at the origin with radius 2.