Change of Variables problems for Study for Exam I

For both of these problems, make sure you at least set them up. Sketching[1] the region *R*: Generally a good idea, if it's not obnoxious. I'd think problem 2 solves out nicely, and I'm less sure about problem 1. I should have it done before office hours on Tuesday.

1. Solve the double integral

$$\iint_R (x^2 y^2)\ dA$$

where *R* is the region enclosed by the ellipse:

$4x^2 + 25y^2 = 100$

2. Solve the double integral

$$\iint_R (x - 2y)(3x - y)\ dA$$

where *R* is the region bounded by the lines:

$x - 2y = 0$
$x - 2y = 4$
$3x - y = 1$
$3x - y = 8$

[1] The emphasis is on "sketch."