ANSWERS TO SOME PROBLEMS OF ASSIGNMENT DUE ON 11/6

1(b) \( \int_2^4 \int_{y^2-3}^{y+1} dx
dy = \ldots 36. \)

2(a) area = \( |(2, 5, 1)| \int_0^5 \int_0^{2^{-4x}} dy\)\(\)\(dx = 5\sqrt{30}. \)

2(c) use polar coordinates and the change of variable formula: \( \int_1^3 \int_0^{2\pi} \sqrt{4\rho^2 + 1} \rho d\theta d\rho = \frac{\pi}{5} (17\sqrt{17} - 5\sqrt{5}). \)

2(d) use spherical coordinates: \( \int_0^{\pi/4} \int_0^{2\pi} 4 \sin \phi \ d\phi d\rho = 8\pi (1 - \sqrt{2}/2). \) You can also solve the problem using polar coordinates.

3(a) use polar coordinates to get \( \int_1^3 \int_0^{2\pi} \ln(\rho^2) \rho d\theta d\rho = \pi (9 \ln 3 - 8). \)

3(b) \( \int \int \int_{u^2 + v^2 \leq 1} 2u du dv = 0. \) The integral can be computed directly, or using polar coordinates.