

Name:

1. Draw the following regions:

(a)  $D = \{(r, \theta) \mid \frac{3\pi}{2} \leq \theta \leq 2\pi, 2 \leq r \leq 6\}$

(b)  $D = \{(r, \theta) \mid \frac{2\pi}{3} \leq \theta \leq \pi, 0 \leq r \leq 1\}$

(c)  $D = \{(r, \theta) \mid \frac{\pi}{6} \leq \theta \leq \frac{5\pi}{4}, 1 \leq r \leq 2\}$ .

2. Evaluate the iterated integral by converting to polar coordinates:

$$\int_0^1 \int_y^{\sqrt{2-y^2}} 3(x+y) dx dy.$$

3. Evaluate  $\iint_R \tan^{-1}\left(\frac{y}{x}\right) dA$  where  $R = \{(x, y) \mid 1 \leq x^2 + y^2 \leq 4, 0 \leq y \leq x\}$ .