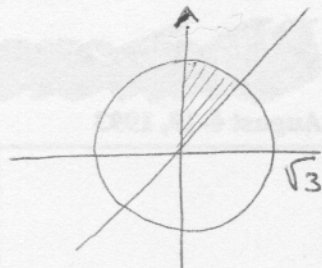


$$(7) \quad I = \iint_D \frac{2x+3y}{1+x^2+y^2} dx dy$$

$$D = \{(x, y) : x^2 + y^2 < 3, 0 < x < y\}$$



$$I = \int_{\pi/4}^{\pi/2} \int_0^{\sqrt{3}} \frac{2\rho \cos\theta + 3\rho \sin\theta}{1+\rho^2} \rho d\rho d\theta$$

$$= \int_0^{\sqrt{3}} \frac{\rho^2}{1+\rho^2} d\rho \left(\int_{\pi/4}^{\pi/2} (2\cos\theta + 3\sin\theta) d\theta \right) =$$

$$= \int_0^{\sqrt{3}} \left(1 - \frac{1}{1+\rho^2}\right) d\rho \left[2\sin\theta \Big|_{\pi/4}^{\pi/2} - 3\cos\theta \Big|_{\pi/4}^{\pi/2} \right] =$$

$$= \left(\sqrt{3} - \arctan\rho \Big|_0^{\sqrt{3}} \right) \left[2 - 2\frac{\sqrt{2}}{2} - 3\left(-\frac{\sqrt{2}}{2}\right) \right] =$$

$$= \left(\sqrt{3} - \arctan\sqrt{3} \right) \left(2 + \frac{\sqrt{2}}{2} \right)$$