

$$\begin{aligned}\iint_R 5(x+y) \, dA &= 5 \int_{\pi/2}^{3\pi/2} \int_1^4 (r \cos \theta + r \sin \theta) r \, dr \, d\theta = 5 \int_{\pi/2}^{3\pi/2} \int_1^4 r^2 (\cos \theta + \sin \theta) \, dr \, d\theta \\ &= 5 \left(\int_{\pi/2}^{3\pi/2} (\cos \theta + \sin \theta) \, d\theta \right) \left(\int_1^4 r^2 \, dr \right) = 5 [\sin \theta - \cos \theta]_{\pi/2}^{3\pi/2} \left[\frac{1}{3} r^3 \right]_1^4 \\ &= 5(-1 - 0 - 1 + 0) \left(\frac{64}{3} - \frac{1}{3} \right) = -210\end{aligned}$$