

$$2. f(x,y) = 3x + 4y + 5$$

$$R = \{(x,y) : x^2 + y^2 \leq 9\}$$

$$f_x = 3$$

$$f_y = 4$$



$$S = \int_{\theta=0}^{2\pi} \int_{r=0}^3 (\sqrt{1+3^2+4^2} r) dr d\theta$$

$$S = \int_{\theta=0}^{2\pi} \int_{r=0}^3 (\sqrt{1+9+16} r) dr d\theta$$

$$S = \int_{\theta=0}^{2\pi} \int_{r=0}^3 (\sqrt{26} r) dr d\theta$$

$$S = \sqrt{26} \int_{\theta=0}^{2\pi} \left[\frac{1}{2} r^2 \right]_{r=0}^{r=3} d\theta$$

$$S = \frac{\sqrt{26}}{2} \int_{\theta=0}^{2\pi} [3^2 - 0^2] d\theta$$

$$S = \frac{9\sqrt{26}}{2} \int_{\theta=0}^{2\pi} d\theta$$

$$S = \frac{9\sqrt{26}}{2} [\theta]_{\theta=0}^{\theta=2\pi}$$

$$S = \frac{9\sqrt{26}}{2} [2\pi - 0]$$

$$= \boxed{9\pi\sqrt{26}}$$