13. $\int_C (2x + 5y^2)\,dy$

$x = 3t \qquad y = 5t \qquad 0 \le t \le 1$

$\frac{y}{5} = t$

$x = 3\left(\frac{y}{5}\right)$

$x = \frac{3}{5}y$

$y = 5t$

$$\int_{y=0}^{y=5} \left(2 \cdot \frac{3}{5}y + 5y^2\right) dy$$

$$= \int_{y=0}^{y=5} \left(\frac{6}{5}y + 5y^2\right) dy$$

$$= \left[\frac{6}{5} \cdot \frac{1}{2}y^2 + \frac{5}{3}y^3\right]_0^5$$

$$= \left[\frac{3}{5}y^2 + \frac{5}{3}y^3\right]_0^5$$

$$= \frac{3}{5} \cdot 5^2 + \frac{5}{3} \cdot 5^3$$

$$= 15 + \frac{625}{3}$$

$$= \frac{45}{3} + \frac{625}{3}$$

$$= \boxed{\frac{670}{3}}$$

$\frac{125}{5}$

$\frac{625}{}$