

Q18

1)

$$x = 2t \quad y = 1 + 3t \quad (0 < t < 1)$$

$$\sqrt{2^2 + 3^2} = \sqrt{13}$$

$$\int_0^1 2t \cdot (1+3t) \cdot \sqrt{13} dt$$

$$\boxed{3\sqrt{13}}$$

2) $dx = 2t dt$ $dy = 3t^2 dt$

$$\int_0^1 (t^2)(t^3)^0 (2t) + (t^2)^2 (t^3) (3t^2) dt$$

$$= \frac{1}{2}$$