

$$2. \int_{x=0}^{x=3} \int_{y=0}^{y=1} (3+x+2y) dy dx$$

$$= \int_{x=0}^{x=3} [3y + xy + 2 \cdot \frac{1}{2} y^2]_{y=0}^{y=1} dx$$

$$= \int_{x=0}^{x=3} [3y + xy + y^2]_{y=0}^{y=1} dx$$

$$= \int_{x=0}^{x=3} [3(1) + x(1) + 1^2 - (3(0) + x(0) + 0^2)] dx$$

$$= \int_{x=0}^{x=3} (3 + x + 1) dx$$

$$= \int_{x=0}^{x=3} (x+4) dx$$

$$= \left[\frac{1}{2} x^2 + 4x \right]_{x=0}^{x=3}$$

$$= \frac{1}{2} (3)^2 + 4(3) - \left(\frac{1}{2} (0)^2 + 4(0) \right)$$

$$= \frac{9}{2} + 12$$

$$= \left(\frac{33}{2} \right)$$