

$$5. z = x^2 y \quad z=0 \quad y=x \quad x=2$$

$$\int_{x=0}^{x=2} \int_{y=0}^{y=x} (x^2 y) dy dx$$

$$= \int_{x=0}^{x=2} \left[ x^2 \cdot \frac{1}{2} y^2 \right]_{y=0}^{y=x} dx$$

$$= \frac{1}{2} \int_{x=0}^{x=2} [x^2 \cdot x^2 - x^2 \cdot 0^2] dx$$

$$= \frac{1}{2} \int_{x=0}^{x=2} (x^4) dx$$

$$= \frac{1}{2} \left[ \frac{1}{5} x^5 \right]_{x=0}^{x=2}$$

$$= \frac{1}{10} [2^5 - 0^5]$$

$$= \frac{32}{10}$$

$$= \left( \frac{16}{5} \right)$$

