

$$4. \vec{F}(x, y, z) = (2x^3) \vec{i} + (5x^2y) \vec{j} + (e^{xy}) \vec{k}$$

$$S: z=5-y, z=0, x=0, x=2, y=0$$

y's

$$z=5-y$$

$$0=5-y$$

$$y=5$$

$$\int_{x=0}^2 \int_{y=0}^5 \int_{z=0}^{z=5-y} (11x^2) dz dy dx$$

$$= 11 \int_{x=0}^2 \int_{y=0}^5 [x^2 z]_{z=0}^{z=5-y} dy dx$$

$$= 11 \int_{x=0}^2 \int_{y=0}^5 [x^2(5-y)] dy dx$$

$$= 11 \int_{x=0}^2 \int_{y=0}^5 (5x^2 - x^2y) dy dx$$

$$= 11 \int_{x=0}^2 [5x^2y - \frac{1}{2}x^2y^2]_{y=0}^{y=5} dx$$

$$= 11 \int_{x=0}^2 [5x^2 \cdot 5 - \frac{1}{2}x^2 \cdot 5^2] dx$$

$$= 11 \int_{x=0}^2 (25x^2 - \frac{25}{2}x^2) dx$$

$$= 11 \int_{x=0}^2 (\frac{25}{2}x^2) dx$$

$$= 11 \cdot \frac{25}{2} \int_{x=0}^2 x^2 dx$$

$$= \frac{11 \cdot 25}{2} \left[ \frac{1}{3}x^3 \right]_{x=0}^{x=2}$$

$$= \frac{11 \cdot 25}{2} \cdot \frac{1}{3} \cdot 8$$

$$= \frac{11 \cdot 25 \cdot 4}{3}$$

$$\frac{1100}{3}$$

$$= \left( \frac{1100}{3} \right)$$