

10/26/20 Quiz for lecture 14

$$1) \int_0^1 \int_x^{3x} \int_0^y x^2 y z \, dz \, dy \, dx$$

$$x^2 y \left. \frac{z^2}{2} \right|_0^y = \int_0^1 \int_x^{3x} \frac{x^2 y^3}{2} \, dy$$

$$\int_x^{3x} \frac{x^2 y^3}{2} \, dy = \frac{x^2}{2} \left(\frac{(3x)^4}{4} - \frac{x^4}{4} \right)$$

$$\int_0^1 10x^6 \, dx = \frac{10}{7} \quad \frac{10x^7}{7}$$

$$2) \int_0^1 \int_0^x \int_{2x}^{3x} yz \ln(x^5) \, dz \, dy \, dx$$

$$\int_0^1 \int_0^x y \ln(x^5) \int_{2x}^{3x} z \, dz \, dy \, dx$$

$$\int_0^1 y \ln(x^5) \left(\frac{9x^2 - 4x^2}{2} \right) \, dy \quad \frac{9x^2 - 4x^2}{2}$$

$$= \int_0^1 \ln(x^5) \left(\frac{5x^4}{4} \right) \, dx$$

$$= -0.25 \text{ (maple)}$$