

11/25/20 Lecture 23 Quiz

$$1) F \equiv \langle 3x^2 y^3 z^3 + yz, \\ 3x^3 y^2 z^3 + xz, \\ 3x^3 y^3 z^2 + xy \rangle$$

$\rightarrow \text{Curl}(F) = 0 \rightarrow \text{Conservative}$

$$\int f_x = x^3 y^3 z^3 + xyz + h(yz)$$

$$\int f_y = y^3 z^3 x + xyz + g(z)$$

$$\int f_z = \cancel{x^3 y^3 z^3} + xyz$$

$$f(x,y,z) = x^3 + y^3 + z^3 + xyz$$

$$2) \int_C 5y \, dx + 10x \, dy$$

$$\int_C P(x,y) \, dx + Q(x,y) \, dy$$

$$\int \left(\frac{dQ}{dx} - \frac{dP}{dy} \right) dA$$

$$P(x,y) = 5y$$

$$Q(x,y) = 10x$$

$$\int_0^1 \int_0^1 5x \, dy = 5$$