

m 11/1/20 Quiz for Lecture 19.

1) $F(x, y, z) = y^2 z^3 i + 2xy z^3 j + 3y^2 z^2 k$

$\frac{d_i}{d_y} = 2yz^3, \frac{d_j}{d_x} = 2yz^3$ ✓

~~$\frac{d_k}{d_z} = 3y^2 z^2$~~ $\frac{d_k}{d_x} = 2y^2 z^2$

This is conservative.

$\frac{df}{dx} = y^2 z^3 \rightarrow xy^2 z^3 + g(y, z)$

$\frac{df}{dy} = 2xy z^3 \rightarrow 2xy z^3 + g(y, z) = 2xy z^3$
 $\rightarrow 0 \rightarrow h(z)$

$F(x, y, z) = xy^2 z^3 + h(z)$

~~$3xy^2 z^2 = \frac{dh}{dz}$~~

$xy^2 z^3 + h(z) = 3x^2 y^2 z$
 $\rightarrow 0$

$= xy^2 z^3 + C$

$$2) \int_C 2xy^2 dx + 2x^2y dy$$

From $(1,0)$ to $(0,1)$

$\rightarrow \langle 4xy, 4xy \rangle \rightarrow$ Conservative.

$$\frac{df}{dy} = 2x^2y + g'(y) = 2x^2y.$$

$$f(x,y) = x^2y^2.$$

$$f(0,1) - f(1,0) = 0 - 0 = 0$$