

Elyas Sanzar

q 19

$$1.) \text{Curl}(F) = \left\langle \frac{d}{dx}, \frac{d}{dy}, \frac{d}{dz} \right\rangle \times (y^2z^3, 2xy^2z^3, 2xy^2z^3, 3xy^2z^2)$$
$$\left\langle \frac{d}{dy} 3xy^2z^3, \frac{d}{dx} 3xy^2z^3 - \frac{d}{dz} y^2z^3, \frac{d}{dx} 2xy^2z^3 - \frac{d}{dy} y^2z^3 \right\rangle$$
$$\langle 6xy^2z^3 - 6xy^2z^3, 3y^2z^3 - 3y^2z^3, 2yz^3 - 2yz^3 \rangle = 0$$

$$\int f_x dx = \int y^2z^3 dx = xy^2z^3 + g(y,z) \quad \text{Yes it's conservative}$$
$$\int f_y dy = \int 2xy^2z^3 dy = xy^2z^3 + g(x,z)$$
$$\int f_z dz = \int 3xy^2z^2 dz = xy^2z^3 + g(x,y) \quad f = xy^2z^3$$

---

2.)  $\int_C x^2 y^2 dr = 0$  because  $f(p) = f(q)$   
integrand is conservative.