

$$\#1 \quad \frac{\partial Q}{\partial z} = 3xy e^{3xyz} + 3x^2 \cos(x^3)$$

$$\frac{\partial Q}{\partial x} = 3yz e^{3xyz}$$

$$\#2 \quad \frac{dz}{dt} = \frac{\partial z}{\partial x} \cdot \frac{\partial x}{\partial t} + \frac{\partial z}{\partial y} \cdot \frac{\partial y}{\partial t}$$

$$= (6x+y)(-3\sin(3t)) + (x)(e^2)$$

plug in
 $x = \cos(3t)$
 $y = e^2 t$

$$\rightarrow = (6\cos(3t) + e^2 t)(-3\sin(3t)) + (\cos(3t)) e^2$$