Quiz 12

$$f = z^2 + xy + ye^{xz}$$

#1 $\nabla f = \langle y + yze^{xz}, x + e^{xz}, 2z + xye^{xz} \rangle$

$\nabla f(0,3,2) = \langle 9, 1, 4 \rangle$

#2 $D_u f(0,3,2) = \langle 9,1,4 \rangle \cdot \frac{\langle 2,-2,1 \rangle}{3} = \frac{20}{3}$

#3 $-\nabla f = \left\langle \frac{-9}{\sqrt{98}}, \frac{-1}{\sqrt{98}}, \frac{-4}{\sqrt{98}} \right\rangle$

#4

$$9(x-0) + 1(y-3) + 4(z-2) = 0$$

$$\Downarrow$$

$$9x + y + 4z = 11$$