Quiz 4

$$h(x,y) = 5 + 3x^2 + 3y^2$$

$$x = s\cos t \qquad y = s\sin t$$

1. $\frac{\partial h}{\partial s} = \frac{\partial h}{\partial x}\frac{\partial x}{\partial s} + \frac{\partial h}{\partial y}\frac{\partial y}{\partial s} =$

$$6x\cdot\cos t + 6y\cdot\sin t =$$

$$6s\cos t\cos t + 6s\sin t\sin t =$$

$$6s(\cos^2 t + \sin^2 t) = 6s$$

2. $h(s\cos t, s\sin t) =$

$$5 + 3s^2\cos^2 t + 3s^2\sin^2 t =$$

$5 + 3s^2$, so

$$\frac{\partial h}{\partial s} = \frac{\partial}{\partial s}(5 + 3s^2) = 6s$$

Same.