1. Find the first partial derivatives of $f(x, y) = x^y$. Then use chain rule to find the derivative of t^t with respect to t.

2. *True / False?* Given a function at f, defined on a disc near the origin. To show that f is not differentiable at the origin, it suffices to find three curves through the origin, such that their tangent lines at the origin do not lie on the same plane.

3. *True / False?* Suppose

$$z = f(x, y), \quad x = g(t, u), \quad y = h(u, v),$$

then by chain rule we have

$$\frac{\partial z}{\partial t} = \frac{\partial z}{\partial x} \frac{\partial x}{\partial t}.$$