MTH 265, Quiz #16, Summer 2024 Name \_\_\_\_

Instructions: Show all work. Use exact answers unless otherwise asked to round.

1. Use the chain rule to find  $\frac{dz}{dt}$  for  $z = \sqrt{1 + x^2 + y^2}$ ,  $x = \ln t$ ,  $y = \cos t$ . Write your final answer in terms of t alone. You do not need to simplify.

2. Use the chain rule to find  $\frac{\partial z}{\partial t}$  and  $\frac{\partial z}{\partial s}$  for  $z = e^r \cos \theta$ , r = st,  $\theta = \sqrt{s^2 + t^2}$ . Write your final answers in term of t and s only. You do not need to simplify.

3. Find  $\frac{\partial z}{\partial x}$  and  $\frac{\partial z}{\partial y}$  for  $yz + x \ln y = z^2$  implicitly.