MATH 16020: Applied Calculus 2 Quiz 12 Mon., Mar. 28, 2022

Please show **all** your work! Answers without supporting work will not be given credit. Write answers in spaces provided.

Name:_____

1. **[6 pts]** Evaluate $\dfrac{dz}{dx}$ at $t = 1$ if

$$z = \exp[x^2 + 4xy + y^2 + 3y] \qquad x = \cos\left(\frac{\pi}{2}t\right) \qquad y = \ln t$$

Answer:_____

2. **[4 pts]** The surface area of a cylinder is given by

$$A(h, r) = 2\pi r^2 + 2\pi rh$$

where h is the height of the cylinder and r is the radius. Suppose

- the height of the cylinder is decreasing at a rate of 4 inches per minute
- the radius of the cylinder is increasing at a rate of 2 inches per minute.

What is the rate of change of the surface area when the height is 10 inches and the radius is 15 inches?

Answer:_____