

1. Find $\frac{dz}{dt}$ at $t = 0$ if $z = x^2 + y^2 + 2xy$, $x = \sin t$, $y = e^t$.

2. The radius of a right circular cone is increasing at a rate of 2 in/sec while its height is decreasing at a rate of 1.5 in/sec. At what rate is the volume of the one changing when

a) radius is 20 in and height is 30 in.

b) radius is 10 in and height is 50 in.