

Assignment4

1. A cylindrical ice block is melting under sun. The height h is decreasing at the rate 3 cm/hour and the radius is decreasing at the rate of 1 cm/hour when $r=15$ cm and $h=40$ cm, what is the rate of change of the volume V at that instant?

2. Suppose that $z=f(x,y)$ satisfies the equation $xyz=\sin(x+y+z)$. Find $\frac{\partial z}{\partial x}$ and $\frac{\partial z}{\partial y}$.

(Hint: Use Implicit Differentiation)

3. Find the directional derivative of $f(x,y,z)=xy+yz+zx$ at $P(1,-1,2)$ in the direction of $\langle 1,1,1 \rangle$

4. Find an equation of the tangent plane at $P(5,2,-3)$ to the surface $xyz + x^2 - 2y^2 + z^2 + 4 = 0$.

