

Math 71A Fall 2009 Hw 4

§ 3.5 #40

What got graded: § 3.6 #12

§ 3.8 #5

35 #40

$$y = \sin(\sin(\sin x)) \quad \left(\text{find } \frac{dy}{dx}\right)$$

↓

$$\frac{dy}{dx} = \cos(\sin(\sin x)) \cdot \frac{d}{dx} [\sin(\sin x)]$$

$$= \cos(\sin(\sin x)) \cdot \cos(\sin x) \cdot \cos x$$

3.6 #12

Find dy/dx by implicit diff'n.

$$1+x = \sin(xy^2)$$

↓

$$1 = \cos(xy^2) \cdot \left[1 \cdot y^2 + x \cdot 2y \frac{dy}{dx} \right]$$

↓

$$1 - y^2 \cos(xy^2) = 2xy \left(\frac{dy}{dx} \right) \cos(xy^2)$$

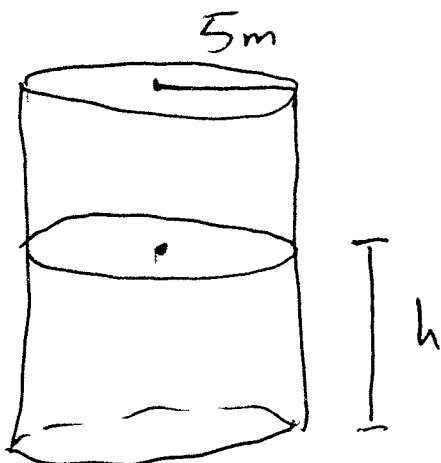
↓

$$\frac{1 - y^2 \cos(xy^2)}{2xy \cos(xy^2)} = \frac{dy}{dx}$$

3.8 #5

radius 5m
Cylindrical tank filling w/water at $3 \frac{\text{m}^3}{\text{min}}$. How fast is the height of the water increasing?

Solution:



$$\text{Vol} = \pi \cdot (5)^2 \cdot h$$
$$\downarrow$$
$$\frac{dV}{dt} = 25\pi \frac{dh}{dt}$$
$$\downarrow$$

$$\left(\frac{\text{m}}{\text{min}} \right) \frac{3}{25\pi} = \frac{dh}{dt}$$

$$\leftarrow 3 = 25\pi \frac{dh}{dt}$$