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Derivatives as a Rate Measurer Ex 13.1 Q1

Let total suface area of the cylinder be A

$$A = 2\pi r(h + r)$$

Differentiating it with respect to r as r varies

$$\frac{dA}{dr} = 2\pi r(0 + 1) + (h + r)2\pi$$

$$= 2\pi r + 2\pi h + 2\pi r$$

$$\frac{dA}{dr} = 4\pi r + 2\pi h$$

Derivatives as a Rate Measurer Ex 13.1 Q2

Let D be the diatmeter and r be the radius of sphere,

So, volume of sphere $= \frac{4}{3}\pi r^2$

$$V = \frac{4}{3}\pi\left(\frac{D}{2}\right)^3$$

$$V = \frac{4}{24}\pi D^3$$

Differentiating it with respect to D.

$$\frac{dv}{dD} = \frac{12}{24}\pi D^2$$

$$\frac{dv}{dD} = \frac{\pi D^2}{2}$$

********** END **********