Derivatives as a Rate Measurer Ex 13.1 Q3

Given, radius of sphere (r) = 2cm .

We know that,

$$v = \frac{4}{3}\pi r^2$$

$$\frac{dv}{dr} = 4\pi r^2 \qquad \text{---(i)}$$

And $A = 4\pi r^2$

$$\frac{dA}{dr} = 8\pi r^2 \qquad \text{---(ii)}$$

Dividing equation (i) by (ii),

$$\frac{\frac{dv}{dr}}{\frac{dA}{dr}} = \frac{4\pi r^2}{8\pi r}$$

$$\frac{dv}{dA} = \frac{r}{2}$$

$$\left(\frac{dv}{dA}\right)_{r=2} = 1$$

Derivatives as a Rate Measurer Ex 13.1 Q4

Let r be two radius of circular disc.

We know that,

Area $A = \pi r^2$

$$\frac{dA}{dr} = 2\pi r \qquad \text{---(i)}$$

Circumference $C = 2\pi r$

$$\frac{dc}{dr} = 2\pi \qquad \text{---(ii)}$$

Dividing equation (i) by (ii),

$$\frac{\frac{dA}{dr}}{\frac{dc}{dr}} = \frac{2\pi r}{2\pi}$$

$$\frac{dA}{dc} = r$$

$$\left(\frac{dA}{dc}\right)_{r=3} = 3$$

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