

Question 7

$$a) \frac{x^2}{2} + y^2 = 8$$

$$y^2 = -\frac{x^2}{2} + 8$$

$$\text{When } x=0 \quad y = \sqrt{8}$$

$$\text{When } y=0 \quad x = 4$$

$$\pi \int_0^4 y^2$$

$$= \pi \int_0^4 -\frac{x^2}{2} + 8$$

$$= \left[-\frac{x^3}{6} + 8x \right]_0^4 \pi$$

$$= \left[\left[-\frac{4^3}{6} + 8 \times 4 \right] - [0] \right] \pi$$

$$= 21\frac{1}{3} \pi u^3$$

$$b) \text{ first try} = \frac{75}{100}$$

$$\text{second try} = \frac{75}{100}$$

$$= \frac{75}{100} \times \frac{75}{100} = \frac{9}{16}$$

$$ii) 1 - \frac{9}{16}$$

$$= \frac{7}{16}$$

c)

$$i) \text{ when } t=0$$

$$x = \frac{0-2}{0+2}$$

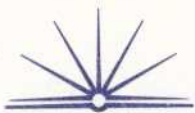
$$x = -1$$

$$ii) \frac{x-4}{t+2} = \frac{1-4}{t+2} = \frac{t-2}{t+2}$$

$$= \frac{t+2-4}{t+2}$$

$$= \frac{t-2}{t+2}$$

$$\therefore \text{LHS} = \text{RHS}$$



iii) when $V=0$ then particle is at Rest

$$\frac{dv}{dt} = \frac{t+2 \times 1 - t-2}{(t-2)^2}$$

$$= \frac{t+2 - t+2}{(t-2)^2}$$

$$= \frac{4}{(t-2)^2}$$

No it's never at rest because $V \neq 0$

iv) ~~4~~ 4