

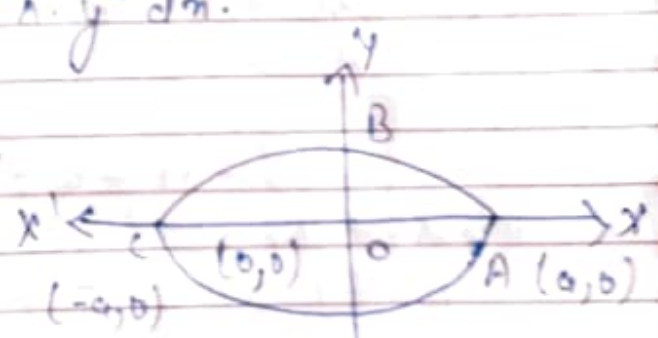
required circle.

Ques 71.

Ans:-

$$\text{Volume } V = \int_{-a}^a \pi \cdot y^2 \, dx.$$

$$= \int_{-a}^a \pi \cdot b^2 \left(1 - \frac{x^2}{a^2} \right) \, dx.$$



$$\left[\because \frac{y^2}{b^2} = 1 - \frac{x^2}{a^2} \text{ or } y^2 = b^2 \left(1 - \frac{x^2}{a^2} \right) \right]$$

$$= \pi \cdot b^2 \int_{-a}^a \left(1 - \frac{x^2}{a^2} \right) \, dx$$

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$$= \pi \cdot b^2 \left[x - \frac{x^3}{3a^2} \right]_{-a}^a$$

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$$= \pi \cdot b^2 \left[\left(a - \frac{a^3}{3a^2} \right) - \left(-a - \frac{-a^3}{3a^2} \right) \right]$$

$$= \pi \cdot b^2 \left[\left(a - \frac{a}{3} \right) - \left(-a + \frac{a}{3} \right) \right]$$

$$= \frac{\pi b^2}{3} [3a - a + 3a - a] = \frac{4}{3} \pi a^2 b^2$$