Ques 8 find out the area of circle $x^2+y^2=a^2$.

Ans $x^2+y^2=a^2$

Center = (0, 0)

Radius = a

OA = OB = Radius = a

A = (a, 0)

B = (0, a)

Area of circle = 4Y Area of OBAO

Date.....

$= 4 \times \int_0^a y \, dx.$

$x^2+y^2=a^2$

$y^2 = a^2 - x^2$

$$\int_0^a y\,dx$$

$$x^2 + y^2 = a^2$$

$$y^2 = a^2 - x^2$$

$$y = \pm\sqrt{a^2 - x^2}$$

AOBA lies in I st quadrant

y is +ve

$$y = \sqrt{a^2 - x^2}$$

Area of circle $= 4\int_0^a \sqrt{a^2 - x^2}\,dx$

$$= 4\left[\frac{x}{2}\sqrt{a^2 - x^2} + \frac{a^2}{2}\sin^{-1}\frac{x}{a}\right]_0^a$$

$$= 4\left[\left(\frac{a}{2}\sqrt{a^2 - a^2} + \frac{a^2}{2}\sin^{-1}\frac{a}{a}\right) - \left(\frac{0}{2}\sqrt{a^2 - 0} + \frac{0^2}{2}\sin^{-1}(0)\right)\right]$$

$$= 4\left[0 + \frac{a^2}{2}\sin^{-1}(-1) - 0 - 0\right]$$

$$= 4x\frac{a^2}{2}\sin^{-1}(1)$$

$$= 4x\frac{a^2}{2} * \frac{\pi}{4} = \pi a^2 \text{ sq. units}$$