

Que 4: Twenty meters of wire is available for fencing off a flower-bed in the form of a circular sector. Then the maximum area (in sq. m) of the flower-bed, is:[JEE-MAIN 2017]

- (1)30
- (2)12.5
- (3)10
- (4)25

Ans 4:

$$\text{Total length} = r + r + r\theta = 20$$

$$\theta = \frac{20 - 2r}{r}$$

$$\text{Area} = \frac{1}{2}r^2\theta = \frac{1}{2}r^2\left(\frac{20-2r}{r}\right)$$

$$A = 10r - r^2$$

$$\frac{dA}{dr} = 0 \Rightarrow 10 - 2r = 0, r = 5$$

$$A = 50 - 25 = 25$$