Name: Riaz Ahmed

Enrollment: 01-166202-013

subject: calculus

class: BC 4

Q1 Find the area of the region bounded by the shaded region.

Let $u = 4 - x^2 \Rightarrow du = 0 - 2x^{2-1}dx \Rightarrow du = -2x\,dx$

$\Rightarrow -\frac{1}{2}\,du = x\,dx$; $x = -2 \Rightarrow u = 0, x = 0$

$\Rightarrow u = 4,\ x = 2 \Rightarrow u = 0.$

$$A = \int_{-2}^{0} x\sqrt{4 - x^2}\,dx + \int_{0}^{2} x\sqrt{4 - x^2}\,dx$$

$$= -\int_{0}^{4} -\frac{1}{2}u^{1/2}du + \int_{4}^{0} -\frac{1}{2}u^{1/2}du$$

$$= \cancel{2}\int_{0}^{4} \frac{1}{\cancel{2}}u^{1/2}du = \int_{0}^{4} u^{1/2}du.$$

$$= \left[\frac{2}{3} U^{3/2} \right]_0^4$$

$$= \frac{2}{3} (4)^{3/2} - \frac{2}{3} (0)^{3/2}$$

$$= \frac{2}{3} \times 4^{(3/2)} - \frac{2}{3} (0)^{3/2}$$

$$= \frac{16}{3}$$

d

c