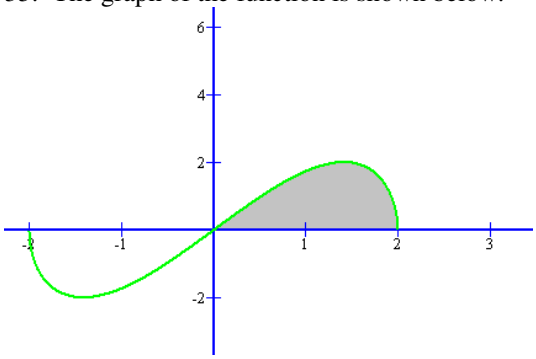
35. The graph of the function is shown below.



The gray area is the area we want to find. To find the area we must integrate the function and evaluate it from 0 to 2.

We are going to use the substitution rule to make the integration a little bit easier.

Let $u = 4 - x^2$

Differentiate

$$du = -2x\,dx$$

$$x\,dx = -\frac{du}{2} = -\frac{1}{2}du$$

$$\int x\sqrt{4-x^2}\,dx = \int (u)^{1/2} \cdot -\frac{1}{2}du = -\frac{1}{2}\int u^{1/2}$$

$$-\frac{1}{2}\left(\frac{2}{3}u^{3/2}\right)$$

Now substitute the value for u back in

$$-\frac{1}{2}\left(\frac{2}{3}\left(4-x^2\right)^{3/2}\right)$$

$$-\frac{1}{3}\left(4-x^2\right)^{3/2}$$

Now evaluate it from 0 to 2.

$$-\frac{1}{3}\left(4-2^2\right)^{3/2} - \left(-\frac{1}{3}\left(4-0^2\right)^{3/2}\right)$$

$$-\frac{1}{3}(0)^{3/2} - \left(-\frac{1}{3}(4)^{3/2}\right)$$

$$0 - \left(-\frac{1}{3}(8)\right)$$

$$0 - \left(-\frac{8}{3}\right)$$

$$\frac{8}{3}$$

Answer B