

The value of the definite integral $\int_0^\pi \frac{d\theta}{5 + 4 \cos \theta}$

is—

(A) $4\pi/3$

(B) $2\pi/3$

(C) π

✓ (D) $\pi/3$

$$\int_0^{2\pi} \frac{d\theta}{a + b \cos \theta} = \frac{2\pi}{\sqrt{a^2 - b^2}} \text{ if } a > b$$

$b = 4$
 $a = 5$

$$\frac{2\pi}{\sqrt{5^2 - 4^2}} = \frac{2\pi}{\sqrt{25 - 16}}$$

$$= \boxed{\frac{2\pi}{3}}$$

$\left(\frac{2\pi}{3}\right) \frac{1}{2} = \frac{\pi}{3}$

$$\int_0^{2\pi} \frac{d\theta}{a + b \sin \theta} \quad \int_0^\infty \frac{1}{1 + x^2}$$