Tahidul Islam
classwork.

$x = 2\cos t \quad y = 2\sin t \quad 0 \le t \le \frac{3\pi}{2}$

$$L = \int_a^b \sqrt{\left(\frac{dx}{dt}\right)^2 + \left(\frac{dy}{dt}\right)^2}\, dt$$

$x = 2\cos t$

$\frac{dx}{dt} = -2\sin t$

$y = 2\sin t.$

$\frac{dy}{dt} = 2\cos t.$

$\left(\frac{dx}{dt}\right)^2 = (-2\sin t)^2 = 4\sin^2 t$

$\left(\frac{dy}{dt}\right)^2 = (2\cos t)^2 = 4\cos^2 t$

$$L = \int_a^b \sqrt{\left(\frac{dx}{dt}\right)^2 + \left(\frac{dy}{dt}\right)^2}\, dt$$

$$= \int_a^b \sqrt{4(\sin^2 t + \cos^2 t)}$$

$a = 0$

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

$$= \int_0^{\frac{3\pi}{2}} 2 \, dt$$

$$= [2t]_0^{3\pi/2}$$

$$= \frac{2 \times 3\pi}{2} - 2.0$$

$$= 3\pi \text{ unit}$$ Ans.