

20-P-KM-AF-016

Curvilinear Tangential Motion: Beginner

$$r \text{ and } v = F \cdot E$$

Q: A car travels along a path described as $y = Ax^2 + B$.
What is \cancel{g} , a_n and ℓ when $x = D$ and E .

$$A: \ell = \frac{[1 + (dy/dx)^2]^{3/2}}{|d^2y/dx^2|}$$

$$dy/dx = 2Ax$$

$$d^2y/dx^2 = 2A$$

$$\ell = \frac{[1 + (2Ax)^2]^{3/2}}{|2A|}$$

$$a_n = F^2/\ell$$

↳ plug in D and E

$$\ell_1 = \frac{[1 + (2AD)^2]^{3/2}}{2A}$$

$$\ell_2 = \frac{[1 + (2AE)^2]^{3/2}}{2A}$$

$$a_{n1} = F^2/\ell_1$$

$$a_{n2} = F^2/\ell_2$$