

#Jenny



Finally I get this ebook, thanks for all these I can get now!

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Cool! I'am really happy

#Markus Jensen



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My friends are so mad that they do not know how I have all the high quality ebook which they do not!

#Diego Butler



so many fake sites. this is the first one which worked! Many thanks

Q. Consider the parabola $y^2 = 8x$. Let Δ_1 be the area of the triangle formed by the end points of its latus rectum and the point $P\left(\frac{1}{2}, 2\right)$ on the parabola, and Δ_2 be the area of the triangle formed by drawing tangents at P and at the end points of the latus rectum. Then $\frac{\Delta_1}{\Delta_2}$ is _____ [IIT-JEE 2011]

BOOK SOLUTION

$y^2 = 8x \Rightarrow a = 2$

$\Delta_1 = \frac{1}{2} \times PT \times AB$

$= \frac{1}{2} \times \frac{3}{2} \times 4a \Rightarrow 3a = 6 \Rightarrow a = 2$.

Let t_1, t_2 and t_3 be the parameters representing P, A and B

$P = (at_1^2, 2at_1) = \left(\frac{1}{2}, 2\right) \Rightarrow t_1 = \frac{1}{2}$

$A = (at_2^2, 2at_2) = (a, 2a) \Rightarrow t_2 = 1$

$B = (at_3^2, 2at_3) = (a, -2a) \Rightarrow t_3 = -1$

Vertices of Δ_2 are $(at_1t_2, a(t_1 + t_2)), (at_2t_3, a(t_2 + t_3)), (at_3t_1, a(t_3 + t_1))$

$= \left(2 \times \frac{1}{2} \times 2, \frac{3}{2}\right), (-2, 0), \left(\frac{-1}{2}, \frac{-1}{2}\right)$

$= (1, 3), (-2, 0), (-1, -1)$

$\Delta_2 = \frac{1}{2} \begin{vmatrix} 1 & 3 & 1 \\ -2 & 0 & 1 \\ -1 & -1 & 1 \end{vmatrix} = \frac{1}{2} [1(-3(-1) + 1(2))] = \frac{6}{2} = 3$

$\frac{\Delta_1}{\Delta_2} = \frac{6}{3} = 2$

PIONEER'S SMART SOLUTION

The area of the triangle formed by three points on a parabola is twice the area of the Δ formed by the tangents at these points.

[Only in Article 231 S.L. Loney Co-ordinate]

$\therefore \Delta_2 = \frac{\Delta_1}{2}$ (by property)

$\therefore \frac{\Delta_1}{\Delta_2} = 2$

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