Q1. 21 January Shift 1

Let the foci of a hyperbola coincide with the foci of the ellipse $\frac{x^2}{36}+\frac{y^2}{16}=1$. If the eccentricity of the hyperbola is 5, then the length of its latus rectum is :

(1) 16 (2) $24\sqrt{5}$ (3) 12 (4) $\frac{96}{\sqrt{5}}$

Q2. 22 January Shift 1

If the line $\alpha x+2y=1$, where $\alpha \in \mathbb{R}$, does not meet the hyperbola $x^2-9y^2=9$, then a possible value of α is:

(1) 0.5 (2) 0.6 (3) 0.7 (4) 0.8

Q3. 22 January Shift 2

Let $\mathrm{P}(10,2\sqrt{15})$ be a point on the hyperbola $\frac{x^2}{\mathrm{a}^2}-\frac{y^2}{\mathrm{b}^2}=1$, whose foci are S and S′. If the length of its latus rectum is 8, then the square of the area of $\Delta \mathrm{PSS}'$ is equal to :

(1) 900 (2) 4200 (3) 1462 (4) 2700

Q4. 23 January Shift 1

Let the domain of the function $f(x)=\log_3\log_5\log_7\left(9x-x^2-13\right)$ be the interval (m,n). Let the hyperbola $\frac{x^2}{\mathrm{a}^2}-\frac{y^2}{\mathrm{b}^2}=1$ have eccentricity $\frac{\mathrm{n}}{3}$ and the length of the latus rectum $\frac{8\,\mathrm{m}}{3}$. Then $\mathrm{b}^2-\mathrm{a}^2$ is equal to :

(1) 7 (2) 11 (3) 5 (4) 9

Q5. 23 January Shift 2

Let PQ be a chord of the hyperbola $\frac{x^2}{4}-\frac{y^2}{b^2}=1$, perpendicular to the x -axis such that OPQ is an equilateral triangle, O being the centre of the hyperbola. If the eccentricity of the hyperbola is $\sqrt{3}$, then the area of the triangle OPQ is

(1) $2\sqrt{3}$ (2) $\frac{11}{5}$ (3) $\frac{9}{5}$ (4) $\frac{8\sqrt{3}}{5}$

Q6. 28 January Shift 1

For some $\theta \in \left(0,\frac{\pi}{2}\right)$, let the eccentricity and the length of the latus rectum of the hyperbola $x^2-y^2\sec^2\theta=8$ be e_1 and l_1, respectively, and let the eccentricity and the length of the latus rectum of the ellipse $x^2\sec^2\theta+y^2=6$ be e_2 and l_2, respectively. If $e_1^2=e_2^2\left(\sec^2\theta+1\right)$, then $\left(\frac{l_1l_2}{e_1e_2}\right)\tan^2\theta$ is equal to ____

ANSWER KEYS

1. (4)	**2.** (4)	**3.** (4)	**4.** (1)	**5.** (4)	**6.** 8