Conic section parabola

1. A double ordinate of the parabola $y^2 = 8px$ is of length $16p$. The angle subtended by it at the vertex of the parabola is

(a) $\frac{\pi}{4}$ (b) $\frac{\pi}{2}$ (c) $\frac{\pi}{3}$ (d) None of these

2. The length of the latus rectum of the parabola $169\{(x-1)^2+(y-3)^2\} = (5x-12y+17)^2$ is

(a) $\frac{14}{13}$ (b) $\frac{28}{13}$ (c) $\frac{12}{13}$ (d) None of these

3. The length of the latus rectum of the parabola $x = ay^2 + by + c$ is

(a) $\frac{a}{4}$ (b) $\frac{a}{3}$ (c) $\frac{1}{a}$ (d) $\frac{1}{4a}$

4. Two common tangents to the circle $x^2 + y^2 = 2a^2$ and parabola $y^2 = 8ax$ are

(a) $x = \pm(y + 2a)$ (b) $y = \pm(x + 2a)$ (c) $x = \pm(y + a)$ (d) $y = \pm(x + a)$

5. If the line $lx + my + n = 0$ is a tangent to the parabola $y^2 = 4ax$, then locus of its point of contact is

(a) A straight line (b) A circle (c) A parabola (d) Two straight lines

6. The tangent drawn at any point *P* to the parabola $y^2 = 4ax$ meets the directrix at the point *K*, then the angle which *KP* subtends at its focus is

(a) 30^o (b) 45^o (c) 60^o (d) 90^o

7. *P* is a point. Two tangents are drawn from it to the parabola $y^2 = 4x$ such that the slope of one tangent is three times the slope of the other. The locus of *P* is

(a) A straight line (b) A circle (c) A parabola (d) An ellipse

8. The parabola $y^2 = kx$ makes an intercept of length 4 on the line $x - 2y = 1$. Then *k* is

(a) $\frac{\sqrt{105}-5}{10}$ (b) $\frac{5-\sqrt{105}}{10}$ (c) $\frac{5+\sqrt{105}}{10}$ (d) None of these

9. If the tangent and normal at any point *P* of a parabola meet the axes in *T* and *G* respectively, then

(a) $ST \neq SG = SP$ (b) $ST - SG \neq SP$ (c) $ST = SG = SP$ (d) $ST = SG \,.\, SP$

10. The number of distinct normals that can be drawn from (–2, 1) to the parabola $y^2 - 4x - 2y - 3 = 0$ is

(a) 1 (b) 2 (c) 3 (d) 0

11. The set of points on the axis of the parabola $y^2 = 4x + 8$ from which the 3 normals to the parabola are all real and different is

(a) $\{(k,0) | \ k \leq -2\}$ (b) $\{(k,0) | \ k > -2\}$ (c) $\{(0,k) | \ k > -2\}$ (d) None of these

12. The chord AB of the parabola $y^2 = 4ax$ cuts the axis of the parabola at C. If $A = (at_1^2, 2at_2)$; $B = (at_2^2, 2at_2)$ and $AC : AB = 1 : 3$, then

(a) $t_2 = 2t_1$ (b) $t_2 + 2t_1 = 0$ (c) $t_1 + 2t_2 = 0$ (d) None of these

13. The locus of the middle points of the focal chord of the parabola $y^2 = 4ax$ is

(a) $y^2 = a(x-a)$ (b) $y^2 = 2a(x-a)$ (c) $y^2 = 4a(x-a)$ (d) None of these

14. If $(4,-2)$ is one end of a focal chord of the parabola $y^2 = x$, then the slope of the tangent drawn at its other end will be

(a) $-\frac{1}{4}$ (b) –4 (c) 4 (d) $\frac{1}{4}$

15. The ordinates of the triangle inscribed in parabola $y^2 = 4ax$ are y_1, y_2, y_3, then the area of triangle is

(a) $\frac{1}{8a}(y_1+y_2)(y_2+y_3)(y_3+y_1)$ (b) $\frac{1}{4a}(y_1+y_2)(y_2+y_3)(y_3+y_1)$

(c) $\frac{1}{8a}(y_1-y_2)(y_2-y_3)(y_3-y_1)$ (d) $\frac{1}{4a}(y_1-y_2)(y_2-y_3)(y_3-y_1)$