

- The HM of the segments of a focal chord of the parabola $y^2 = 4ax$ is
 (a) $4a$ (b) $2a$ (c) a (d) a^2
- The length of a focal chord of the parabola $y^2 = 4ax$ at a distance b from the vertex is c . Then
 (a) $2a^2 = bc$ (b) $a^3 = b^2c$ (c) $ac = b^2$ (d) $b^2c = 4a^3$
- 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
- 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) $\pi/4$ (b) $\pi/2$ (c) $\pi/3$ (d) none of these
- The chord AB of the parabola $y^2 = 4ax$ cuts the axis of the parabola at C . If $A = (at_1^2, 2at_1)$, $B = (at_2^2, 2at_2)$ 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
- AB is a chord of the parabola $y^2 = 4ax$. If its equation is $y = mx + c$ and it subtends a right angle at the vertex of the parabola then
 (a) $c = 4am$ (b) $a = 4mc$ (c) $c = -4am$ (d) $a + 4mc = 0$
- If ' t_1 ' and ' t_2 ' are the ends of a focal chord of the parabola $y^2 = 2x$ then
 (a) $t_1^2 + t_2^2 = 2$ (b) $t_1 + t_2 = 1$ (c) $t_1t_2 = -1$ (d) none of these
- A ray of light moving parallel to the x -axis reflected from a parabolic mirror whose equation is $(y - 2)^2 = 4(x + 1)$. After reflection, the ray must pass through the point
 (a) $(0, 2)$ (b) $(2, 0)$ (c) $(0, -2)$ (d) $(-1, 2)$
- The equation of a parabola is $y^2 = 4x$. $P(1, 3)$ and $Q(1, 1)$ are two points in the x - y plane. Then, for the parabola
 (a) P and Q are exterior points (b) P is an interior point while Q is an exterior point
 (c) P and Q are interior points (d) P is an exterior point while Q is an interior point
- The ends of a line segment are $P(1, 3)$ and $Q(1, 1)$. R is a point on the line segment PQ such that $PR : QR = 1 : \lambda$. If R is an interior point of the parabola $y^2 = 4x$ then
 (a) $\lambda \in (0, 1)$ (b) $\lambda \in \left(-\frac{3}{5}, 1\right)$ (c) $\lambda \in \left(\frac{1}{2}, \frac{3}{5}\right)$ (d) none of these
- The range of values of λ for which the point $(\lambda, -1)$ is exterior to both the parabolas $y^2 = |x|$ is
 (a) $(0, 1)$ (b) $(-1, 1)$ (c) $(-1, 0)$ (d) none of these
- The number of points with integral coordinates that lie in the interior of the region common to the circle $x^2 + y^2 = 16$ and the parabola $y^2 = 4x$ is
 (a) 8 (b) 10 (c) 16 (d) none of these
- The tangents to the parabola $y^2 = 4x$ at the points $(1, 2)$ and $(4, 4)$ meet on the line
 (a) $x = 3$ (b) $x + y = 4$ (c) $y = 3$ (d) none of these
- The triangle formed by the tangents to a parabola $y^2 = 4ax$ at the ends of the latus rectum and the double ordinate through the focus is
 (a) equilateral
 (b) isosceles
 (c) right-angled isosceles
 (d) dependent on the value of a for its classification

15. The tangents from the origin to the parabola $y^2 + 4 = 4x$ are inclined at
 (a) $\pi/6$ (b) $\pi/4$ (c) $\pi/3$ (d) $\pi/2$
16. The tangents to a parabola at the vertex V and any point P meet at Q. If S be the focus then SP, SQ, SV are in
 (a) AP (b) GP (c) HP (d) none of these
17. 't₁' and 't₂' are two points on the parabola $y^2 = 4x$. If the chord joining them is a normal to the parabola at 't₁' then
 (a) $t_1 + t_2 = 0$ (b) $t_1(t_1 + t_2) = 1$ (c) $t_1(t_1 + t_2) + 2 = 0$ (d) $t_1 t_2 + 1 = 0$
18. The normal to the curve $x = at^2, y = 2at$ at the point P(t) meets the curve again at Q(t'). Then t' is
 (a) $t + \frac{1}{t}$ (b) $-t - \frac{2}{t}$ (c) $t + \frac{2}{t}$ (d) $t - \frac{1}{t}$
19. 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
20. The arithmetic mean of the ordinates of the feet of the normals from (3, 5) to the parabola $y^2 = 8x$ is
 (a) 4 (b) 0 (c) 8 (d) none of these
21. If two of three feet of normals drawn from a point to the parabola $y^2 = 4x$ be (1, 2) and (1, -2) then the third foot is
 (a) (2, 2√2) (b) (2, -2√2) (c) (0, 0) (d) none of these
22. Let P, Q, R be three points on a parabola, normals at which are concurrent. The centroid of the ΔPQR must lie on
 (a) a line parallel to the directrix (b) the axis of the parabola
 (c) a line of slope 1 passing through the vertex (d) none of these
23. The vertex of the parabola $y^2 = 8x$ is at the centre of a circle and the parabola cuts the circle at the ends of its latus rectum. Then the equation of the circle is
 (a) $x^2 + y^2 = 4$ (b) $x^2 + y^2 = 20$ (c) $x^2 + y^2 = 80$ (d) none of these
24. The circle $x^2 + y^2 + 2\lambda x = 0, \lambda \in \mathbb{R}$, touches the parabola $y^2 = 4x$ externally. Then
 (a) $\lambda > 0$ (b) $\lambda < 0$ (c) $\lambda > 1$ (d) none of these
25. The locus of a point from which tangents to a parabola are at right angles is a
 (a) straight line (b) pair of straight lines (c) circle (d) parabola
26. The locus of the middle points of parallel chords of a parabola $x^2 = 4ay$ is a
 (a) straight line parallel to the x-axis
 (b) straight line parallel to the y-axis
 (c) circle
 (d) straight line parallel to a bisector of the angles between the axes
27. The locus of the middle points of chords of the parabola $y^2 = 8x$ drawn through the vertex is a parabola whose
 (a) focus is (2, 0) (b) latus rectum = 8 (c) focus is (0, 2) (d) latus rectum = 4
28. The curve described parametrically by $x = t^2 + t + 1, y = t^2 - t + 1$ represents
 (a) a pair of straight lines (b) an ellipse
 (c) a parabola (d) a hyperbola
29. The equation of a parabola whose focus is (-3, 0) and the directrix is $x + 5 = 0$, is
 (a) $x^2 = 4(y - 4)$ (b) $x^2 = 4(y + 5)$ (c) $y^2 = 4(x - 4)$ (d) $y^2 = 4(x + 4)$.
30. If (2, 0) is the vertex and y-axis is the directrix of a parabola, then its focus is
 (a) (2, 0) (b) (-2, 0) (c) (4, 0) (d) (-4, 0)