PARABOLA
DPP - 1

1. The equation $x^2 - 2xy + y^2 + 3x + 2 = 0$ represents.
(A) A parabola (B) An ellipse (C) A hyperbola (D) A circle

2. The centre of $14x^2 - 4xy + 11y^2 - 44x - 58y + 71 = 0$ is -
(A) (2,3) (B) (2, – 3) (C) (–2,3) (D) (–2, –3)

3. The equation of parabola whose focus is (5,3) and directrix is $3x - 4y + 1 = 0$, is
(A) $(4x + 3y)^2 - 256x - 142y + 849 = 0$ (B) $(4x - 3y)^2 - 256x - 142y + 849 = 0$
(C) $(3x + 4y)^2 - 142x - 256y + 849 = 0$ (D) $(3x - 4y)^2 - 256x - 142y + 849 = 0$

4. The point on the parabola $y^2 = 18x$, for which the ordinate is three times the abscissa, is
(A) (6,2) (B) (–2,–6) (C) (3,18) (D) (2,6)

5. The equation of the directrix of parabola $5y^2 = 4x$ is
(A) $4x - 1 = 0$ (B) $4x + 1 = 0$ (C) $5x + 1 = 0$ (D) $5x - 1 = 0$

6. Focus and directrix of the parabola $x^2 = -8ay$ are
(A) $(0, -2a)$ and $y = 2a$ (B) $(0, 2a)$ and $y = -2a$
(C) $(2a, 0)$ and $x = -2a$ (D) $(-2a, 0)$ and $x = 2a$

7. The equation of the parabola with its vertex at the origin, axis on the y -axis and passing through the point (6,-3) is
(A) $y^2 = 12x + 6$ (B) $x^2 = 12y$ (C) $x^2 = -12y$ (D) $y^2 = -12x + 6$

8. Vertex of the parabola $x^2 + 4x + 2y - 7 = 0$ is
(A) (–2, 11/2) (B) (-2,2) (C) (-2,11) (D) (2,11)

Integer Type

9. Find the point on the parabola $y^2 = 8x$. Whose distance from the focus is 8 , has x -coordinate as

10. The parabola $y^2 = 4ax$ passes through $(-3, 2)$, if the length of its latus rectum is in the form of a/b (where a and b are coprime number)

PARABOLA
DPP - 2

1. The equation of the directrix of the parabola $y^2+4y+4x+2=0$ is

(A) $x=-1$ (B) $x=1$ (C) $x=\frac{-3}{2}$ (D) $x=\frac{3}{2}$

2. The line $x-1=0$ is the directrix of the parabola $y^2-kx+8=0$. Then one of the values of k is

(A) $\frac{1}{8}$ (B) 8 (C) 4 (D) $\frac{1}{4}$

3. Equation of the parabola with its vertex at (1,1) and focus (3,1) is

(A) $(x-1)^2=8(y-1)$ (B) $(y-1)^2=8(x-3)$

(C) $(y-1)^2=8(x-1)$ (D) $(x-3)^2=8(y-1)$

4. $x-2=t^2, y=2t$ are the parametric equations of the parabola

(A) $y^2=4x$ (B) $y^2=-4x$ (C) $x^2=-4y$ (D) $y^2=4(x-2)$

5. 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

6. 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 $PQ:QR=1:\lambda$. 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

7. The straight line y = 2x + λ does not meet the parabola y^2 = 2x, if

(A) $\lambda<\frac{1}{4}$ (B) $\lambda>\frac{1}{4}$ (c) $\lambda=4$ (D) $\lambda=1$

8. The Focus of the parabola $4y^2$ – 6x – 4y = 5 is

(A) $(-8/5,2)$ (B) $(-5/8,1/2)$ (C) $(1/2,5/8)$ (D) $(6/8,-1/2)$

9. If the parabola $y^2=4ax$ passes through the point $(1,-2),$ then the tangent at this point is

(A) $x+y-1=0$ (B) $x-y-1=0$ (C) $x+y+1=0$ (D) $x-y+1=0$

Sol. **C**

10. The equation of the tangent to the parabola $y^2=16x$, which is perpendicular to the line $y=3x+7$ is

(A) $y\quad 3x+4=0$ (B) $3y\quad x+36=0$ (C) $3y+x-36=0$ (D) $3y+x+36=0$

PARABOLA
DPP - 3

1. If the tangent to the parabola $y^2 = ax$ makes an angle of 45° with x -axis, then the point of contact is

(A) $\left(\frac{a}{2}, \frac{a}{2}\right)$ (B) $\left(\frac{a}{4}, \frac{a}{4}\right)$ (C) $\left(\frac{a}{2}, \frac{a}{4}\right)$ (D) $\left(\frac{a}{4}, \frac{a}{2}\right)$

2. The line $x - y + 2 = 0$ touches the parabola $y^2 = 8x$ at the point

(A) (2, -4) (B) $(1, 2\sqrt{2})$ (C) $(4, -4\sqrt{2})$ (D) (2,4)

3. The equation of the tangent to the parabola at point $\left(a/t^2, 2a/t\right)$ is

(A) $ty = xt^2 + a$ (B) ty = x + at^2 (C) y = tx + at^2 (D) t = tx + (a/t^2)

4. Two tangents are drawn from the point (-2,-1) to the parabola $y^2 = 4x$. If α is the angle between these tangents, then $\tan\alpha =$

(A) 3 (B) $1/3$ (C) 2 (D) $1/2$

5. If $\left(\frac{a}{b}\right)^{1/3} + \left(\frac{b}{a}\right)^{1/3} = \frac{\sqrt{3}}{2}$, then the angle of intersection of the parabola $y^2 = 4ax$ and $x^2 = 4by$ at a point other than the origin is

(A) $\pi/4$ (B) $\pi/3$ (C) $\pi/2$ (D) None of these

6. The equation of the common tangent touching the circle $(x-3)^2 + y^2 = 9$ and the parabola $y^2 = 4x$ above the x -axis, is

(A) $\sqrt{3}y = 3x + 1$ (B) $\sqrt{3}y = -(x+3)$ (C) $\sqrt{3}y = x + 3$ (D) $\sqrt{3}y = -(3x+1)$

7. If $a \neq 0$ and the line $2bx + 3cy + 4d = 0$ passes through the points of intersection of the parabolas $y^2 = 4ax$ and $x^2 = 4ay$ then

(A) $d^2 + (3b - 2c)^2 = 0$ (B) $d^2 + (3b + 2c)^2 = 0$

(C) $d^2 + (2b - 3c)^2 = 0$ (D) $d^2 + (2b + 3c)^2 = 0$

8. If x + y = k is a normal to the parabola y^2 = 12x, then k is

(A) 3 (B) 9 (C) –9 (D) -3

9. The equation of normal at the point $\left(\frac{a}{4}, a\right)$ to the parabola $y^2 = 4ax,$ is

(A) $4x + 8y + 9a = 0$ (B) $4x + 8y - 9a = 0$ (C) $4x + y - a = 0$ (D) $4x - y + a = 0$

10. The point on the parabola $y^2 = 8x$ at which the normal is parallel to the line $x - 2y + 5 = 0$ is

(A) $(-1/2, 2)$ (B) $(1/2, -2)$ (C) $(2, -1/2)$ (D) $(-2, 1/2)$

PARABOLA
DPP - 4+5

1. The equations of the normal at the ends of the latus rectum of the parabola $y^2 = 4ax$ are given by

(A) $x^2 - y^2 - 6ax + 9a^2 = 0$ (B) $x^2 - y^2 - 6ax - 6ay + 9a^2 = 0$

(C) $x^2 - y^2 - 6ay + 9a^2 = 0$ (D) None of these

2. The normals at three points P,Q,R of the parabola $y^2 = 4ax$ meet in (h,k), the centroid of triangle PQR lies on

(A) x = 0 (B) $y = 0$ (C) $x = -a$ (D) $y = a$

3. If two of the 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) $(2, 2\sqrt{2})$ (B) $(2, -2\sqrt{2})$ (C) (0,0) (D) None of these

4. If the points $\left(au^2, 2au\right)$ and $\left(av^2, 2av\right)$ are the extremities of a focal chord of the parabola $y^2 = 4ax$, then

(A) uv – 1 = 0 (B) $uv + 1 = 0$ (C) $u + v = 0$ (D) $u - y = 0$

5. The locus of the midpoint of the line segment joining the focus to a moving point on the parabola $y^2 = 4ax$ is another parabola with the directrix

(A) $x = -a$ (B) $x = -\frac{a}{2}$ (C) $x = 0$ (D) $x = \frac{a}{2}$

6. The length of chord of contact of the tangents drawn from the point (2,5) to the parabola $y^2 = 8x,$ is

(A) $\frac{1}{2}\sqrt{41}$ (B) $\sqrt{41}$ (C) $\frac{3}{2}\sqrt{41}$ (D) $2\sqrt{41}$

7. If b, k are the intercept of a focal chord of the parabola $y^2 = 4ax,$ then K is equal to

(A) $\frac{ab}{b-a}$ (B) $\frac{b}{b-a}$ (C) $\frac{a}{b-a}$ (D) $\frac{ab}{a-b}$

8. The length of the sub tangent to the parabola $y^2 = 16x$ at the point whose abscissa is 4, is

(A) 2 (B) 4 (C) 8 (D) None of these

9. If P is a point on the parabola $y^2 = 4ax$ such that the subtangent and subnormal at P are equal, then the coordinates of P are

(A) (a,2a) or (a, - 2a) (B) $(2a, 2\sqrt{2}a)$ or $(2a, -2\sqrt{2}a)$

(C) $(4a, -4a)$ or $(4a, 4a)$ (D) None of these

10. The pole of the line $2x = y$ with respect to the purubola $y^2 = 2x$ is

(A) $\left(0, \frac{1}{2}\right)$ (B) $\left(\frac{1}{2}, 0\right)$ (C) $\left(0, -\frac{1}{2}\right)$ (D) None of these