Parabola

Assignment8 by:Gaurav sir

Paragraph for Question Nos. 1 to - 1

If l, m are variable real numbers such that $5l^2 + 6m^2 - 4lm + 3l = 0$, then variable line $lx + my = 1$ always touches a fixed parabola, whose axes is parallel to x −axis

1. Vertex of the parabola is

   a) $\left(-\frac{5}{3}, \frac{4}{3}\right)$ b) $\left(-\frac{7}{4}, \frac{3}{4}\right)$ c) $\left(\frac{5}{6}, -\frac{7}{6}\right)$ d) $\left(\frac{1}{2}, -\frac{3}{4}\right)$

Paragraph for Question Nos. 2 to - 2

Consider the parabola whose focus is at (0,0) and tangent at vertex is $x - y + 1 = 0$

665 The length of latus rectum is

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a) $4\sqrt{2}$ b) $2\sqrt{2}$ c) $8\sqrt{2}$ d) $3\sqrt{2}$

3. Two parabolas have the same focus. If their directrices are the x–axis and the y-axis, respectively, then the slope of their common chord is

   a) ± 1 b) $\frac{4}{3}$ c) $\frac{3}{4}$ d)None of these

4. The length of the chord of the parabola $y^2 = x$ which is bisected at the point (2,1) is

   a) $2\sqrt{3}$ b) $4\sqrt{3}$ c) $3\sqrt{2}$ d) $2\sqrt{5}$

5. If$y = 2x - 3$ is a tangent to the parabola$y^2 = 4a\left(x - \frac{1}{3}\right)$, then '$a$' is equal to

   a) $\frac{22}{3}$ b) -1 c) $\frac{14}{3}$ d) $\frac{-14}{3}$

6. Vertex of the parabola whose parametric equation is $x = t^2 - t + 1, y = t^2 + t + 1; t\epsilon\ R$, is

   a) (1,1) b) (2,2) c) $\left(\frac{1}{2}, \frac{1}{2}\right)$ d) (3,3)

7. Consider the parabola$y^2 = 4x$. $A \equiv (4, -4)$ and$B \equiv (9, 6)$ be two fixed points on the parabola. Let 'C' be a moving point on the parabola between$A$ and$B$ such that the area of the triangleABC is maximum, then coordiante of 'C'

   a) $\left(\frac{1}{4}, 1\right)$ b) (4,4) c) $(3, 2\sqrt{3})$ d) $(3, -2\sqrt{3})$

8. From a point$(\sin\theta, \cos\theta)$ if three normals can be drawn to the parabola $y^2 = 4ax$ then the value of'a' is

   a) $\left(\frac{1}{2}, 1\right)$ b) $\left[\frac{1}{2}0\right)$ c) $\left[\frac{1}{2}, 1\right]$ d) $\left(-\frac{1}{2}, 0\right) \cup \left(0, \frac{1}{2}\right)$

9. P, Q, R are the feet of the normals drawn to a parabola$(y-3)^2 = 8(x-2)$. A circle cuts the above parabola in pointsP, Q, R and$S$. Then this circle always passes through the point
   a) (2,3) b) (3,2) c) (0,3) d) (2,0)
10. If 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) $\frac{1}{4}$
11. The mirror image of the parabola $y^2 = 4x$ in the tangent ot the parabola at the point (1,2) is
    a) $(x-1)^2 = 4(y+1)$ b) $(x+1)^2 = 4(y+1)$ c) $(x+1)^2 = 4(y-1)$ d) $(x-1)^2 = 4(y-1)$
12. If parabola $y^2 = \lambda x$ and $25\,[(x-3)^2 + (y+2)^2] = (3x - 4y - 2)^2$ are equal, then value of λ is
    a) 9 b) 3 c) 7 d) 6

13. If the line $x + y = 6$ is a normal to the parabola $y^2 = 8x$ at point (a, b) then the value of $a + b$ is
14. If the point $P(4,-2)$ is the one end of the focal chord PQ of the $y^2 = x$, then the slope of the tangent at Q is
15. The equation of the line touching both the parabolas $y^2 = 4x$ and $x^2 = -32y$ is $ax + by + c = 0$ then the value of $a + b + c$ is

Parabola

Date:- March 28, 2020 Assignment-8 By :- Ashok Kumar

* mark question denotes one or more than one correct answer

1. The equation of the tangent to the parabola $y^2 = 9x$ which goes through the point $(4, 10)$, is
   a) $x + 4y + 1 = 0$ b) $9x + 4y + 4 = 0$ c) $x + 4y + 36 = 0$ d) $9x - 4y + 4 = 0$

2. From the point $(-1, -6)$ two tangents are drawn to the parabola $y^2 = 4x$. Then, the angle between the two tangents is
   a) $30°$ b) $45°$ c) $60°$ d) $90°$

3. The number of normal drawn to the parabola $y^2 = 4x$ from the point $(1,0)$ is
   a) 0 b) 1 c) 2 d) 3

4. The equation of the latusrectum of the parabola $x^2 + 4x + 2y = 0$, is equal to
   a) $2y + 3 = 0$ b) $3y = 2$ c) $2y = 3$ d) $3y + 2 = 0$

5. If the focus and vertex of a parabola are the points $(0,2)$ and $(0,4)$ respectively, then its equation is
   a) $y^2 = 8x + 32$ b) $y^2 = -88x + 32$ c) $x^2 + 8y = 32$ d) $x^2 - 8y = 32$

6. If $y = 2x - 3$ is a tangent to the parabola $y^2 = 4a\left(x - \frac{1}{3}\right)$, then '$a$' is equal to
   a) $\frac{22}{3}$ b) -1 c) $\frac{14}{3}$ d) $\frac{-14}{3}$

7. If the parabola $y = ax^2 - 6x + b$ passes through $(0, 2)$ and has its tangent at $x = \frac{3}{2}$ parallel to the x–axis then
   a) $a = 2, b = -2$ b) $a = 2, b = 2$ c) $a = -2, b = 2$ d) $a = -2, b = -2$

8. The number of common chords of the parabolas $x = y^2 - 6y + 11$ and $y = x^2 - 6x + 1$ are
   a) 1 b) 2 c) 4 d) 6

9. *The equation of the tangent to the parabola $y^2 = 9x$ which goes through the point $(4, 10)$ is
   a) $x + 4y + 1 = 0$ b) $9x + 4y + 4 = 0$ c) $x - 4y + 36 = 0$ d) $9x - 4y + 4 = 0$

10. *If equation of directrix of the parabola $x^2 + 4y - 6x + k = 0$ is $y + 1 = 0$, then
    a) $k = 17$ b) $k = -17$ c) Focus is $(3, -3)$ d) Vertex is $(3, -3)$

11.

Statement 1: The values of α for which the point (α, α^2) lies inside the triangle formed by the lines $x = 0, x + y = 2$ and $3y = x$ is $(0,1)$

Statement 2: Parabola $y = x^2$ meets the line $x + y = 2$ at $(1, 1)$

a) Statement 1 is True, Statement 2 is True; Statement 2 **is** correct explanation for Statement 1

b) Statement 1 is True, Statement 2 is True; Statement 2 **is not** correct explanation for Statement 1

c) Statement 1 is True, Statement 2 is False

d) Statement 1 is False, Statement 2 is True

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Statement 1: Slope of tangents drawn from$(4,10)$ to parabola $y^2 = 9x$ are $\frac{1}{4}, \frac{9}{4}$

Statement 2: Two tangents can be drawn to parabola from any point lying outside parabola

a) Statement 1 is True, Statement 2 is True; Statement 2 **is** correct explanation for Statement 1

b) Statement 1 is True, Statement 2 is True; Statement 2 **is not** correct explanation for Statement 1

c) Statement 1 is True, Statement 2 is False

d) Statement 1 is False, Statement 2 is True

13. Line $y = 2x - b$ cuts the parabola $y = x^2 - 4x$ at points A and B. Then the value of b for which the $\angle AOB$ is a right angle is

14. A line through the origin intersects the parabola $5y = 2x^2 - 9x + 10$ at two points whose x-coordinates add up to 17. Then the slope of the line is

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