

**MTH 103**

**Tutorial**

**Questions**





- a. 5 square units      b. -7 square units      c. 6 square units      d. 7 square units

11. The locus of a point  $P(x,y)$  which moves so that the ratio of its distance from a fixed point  $S$  (the focus) to its distance from a fixed straight line  $ZQ$  (the directrix) is a constant ( $e$ , called eccentricity), has different forms according to the value of  $e$ . The locus is known as \_\_\_\_\_ when  $e=1$

- (a). perbola      (b). Hyperbola      (c). Parabola      (d). Ellipse

12. The locus of a point  $P(x,y)$  which moves so that the ratio of its distance from a fixed point  $S$  (the focus) to its distance from a fixed straight line  $ZQ$  (the directrix) is a constant ( $e$ , called eccentricity), has different forms according to the value of  $e$ . The locus is known as \_\_\_\_\_ when  $e<1$

- (a). perbola      (b). Hyperbola      (c). Elilipse      (d). Parabola

13. The locus of a point  $P(x,y)$  which moves so that the ratio of its distance from a fixed point  $S$  (the focus) to its distance from a fixed straight line  $ZQ$  (the directrix) is a constant ( $e$ , called eccentricity), has different forms according to the value of  $e$ . The locus is known as \_\_\_\_\_ when  $e>1$

- ((a). perbola      (b). Parabola      (c). Elilipse      (d). Hyperbola

14. Find the equation of the tangents to the parabola  $y^2=48x$  at the points  $(3,12)$ ,  $(48,-48)$ .

- (a).  $y=x/2+24$       (b).  $y=x/2-24$       (c).  $y=-x/2-24$       (d).  $y=-x/2+24$

15. For the parabola  $y^2=48x$  at the points  $(3,12)$ ,  $(48,-48)$ . Find their point of intersection

- (a).  $a=12, x=12, y=-18$       (b).  $a=12, x=-12, y=-18$       (c).  $a=12, x=-12, y=18$       (d).  $a=12, x=12, y=18$

16. Find the equations of the tangents from the point  $(2,4)$  to the parabola  $y^2=6x$  at  $m=1/2$ .

- (a).  $y=x/2+3$       (b).  $y=x/2-3$       (c).  $y=3x/2+3$       (d).  $y=3x/2+1$

17. Find the equations of the tangents from the point  $(2,4)$  to the parabola  $y^2=6x$  at  $m=3/2$ .

- (a).  $y=3x/2+1$       (b).  $y=x/2-3$       (c).  $y=3x/2+3$       (d).  $y=x/2+3$

18. Find the eccentricity of the ellipse  $x^2/25+y^2/16=1$

- (a).  $-3/5$       (b).  $3/5$       (c).  $5/3$       (d).  $-5/3$

19. Find the coordinates of the foci to the ellipse  $x^2/25+y^2/16=1$

- (a).  $(+3,0)$       (b).  $(-3,0)$       (c).  $(+_3,0)$       (d).  $(+_3)$

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20. Find the equation of the directrices of the ellipse  $x^2/25+y^2/16=1$

- (a).  $(3/25)$                       (b).  $(-25/3)$                       (c).  $(+25/3)$                       (d).  $(+_25/3)$

21. Given the three circles  $x^2+y^2-16x+60=0$ ,  $x^2+y^2-12x+20=0$  and  $x^2+y^2-16x-12y+84=0$ . Find the coordinates of point such that the lengths of the tangents from it to each of the three circles are equal.

- a.  $(10,22)$                       b.  $(-10,22)$                       c.  $(10,-22)$                       d.  $(-10,-22)$

22. The parabola  $y^2=4ax$  passes through the point  $(2,-4)$ . Find the coordinates of the focus.

- a.  $(0,2)$                       b.  $(2,0)$                       c.  $(-2,0)$                       d.  $(2,1)$

23. The normal to the parabola  $y^2=12x$  at the point  $(3,6)$  is produced to meet the curve again at the point Q. Find the coordinates of Q.

- a. b. c.  $(27,-18)$  d.

24. Find the line of the latus rectum of the parabola  $4x=t^2, 2y=t$

- a. -1unit                      b. 2units                      c. -2units                      d. 1unit

25. The tangent at the point T to the curve  $x=acost, y=bsinT$  meets the x-axis at A and the y-axis at B. If O is the origin, find the minimum area of triangle AOB.

- (a). -ab                      (b). a                      (c).                      a(d). ab

26. Find the Cartesian form of the equations of the loci  $x=4t, y=4/t$

- a.  $xy=-6$                       b.  $xy=6$                       c.  $xy=16$                       d.  $xy=-16$

27. Find the Cartesian form of the equations of the loci  $x=1+3t, y=3/t$

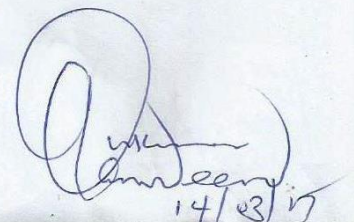
- a.  $(-x-1)y=9$                       b.  $(x-1)y=9$                       c.  $(x-1)y=-9$                       d.  $(x+1)y=9$

28. Find the equation of the tangents to the hyperbola  $x^2-y^2=7$  which are parallel to  $3y=4x$ .

- a.  $4x-3y=+_7$                       b.  $4x-3y=7$                       c.  $4x-3y=-7$                       d.  $4x+3y=+_7$

29. Find the locus of the mid-point of a straight line which moves so that its always cuts off a constant area  $k^2$  from the corner of a square

- a.  $2xy=k^2$                       b.  $2xy=-k^2$                       c.  $-2xy=k^2$                       d.  $2xy=k$

  
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30. Find the equation of the normal to the parabola  $y^2=4ax$  at the point  $(at^2,2at)$ . P,Q are two points on the parabola such that the chord PQ Subtends a right angle at the vertex of the parabola. Find the locus of the point of intersection of the normals at P and Q.

- a.  $y^2=-16a(x-2a)$       b.  $y^2=16a(x+2a)$       c.  $y^2=-16a(x+2a)$       d.  $y^2=16a(x-2a)$

31. The asymptotes will each be inclined at \_\_\_\_\_ to the x-axis.

- (a).  $90^\circ$       (b).  $45^\circ$       (c).  $180^\circ$       (d).  $60^\circ$

32. Find the centre and radius of  $x^2+y^2+2x+6y+6=0$

- a. C(-1,-3), r=2      b. C(-1,3), r=2      c. C(1,-3), r=2      d. C(1,-3), r=2

33. Find the equation of the circle center (7,-6) which touches the line  $3x-4y+5=0$

- (a)  $x^2+y^2-14x+12y-15=0$ . (b)  $x^2-y^2-14x+12y-15=0$ . (c)  $x^2+y^2-14x+12y+15=0$ .  
(d)  $x^2+y^2+14x+12y-15=0$ .

34. Find the equation of the circle passing through the points (0,0), (3,1), (5,5)

- a.  $x^2-y^2+10y=0$       b.  $x^2+y^2-10y=0$       c.  $x^2-y^2-10y=0$       d.  $x^2+y^2+10y=0$

35. Find the equation of the tangent to the circle  $2x^2+2y^2+x-11y=0$  at (-2,5)

- a.  $7x+9y-59=0$       b.  $7x+9y+59=0$       c.  $7x-9y+59=0$       d.  $7x-9y-59=0$

36. Find the point of intersection of the line  $x+y-3=0$  and the circle  $x^2+y^2+x-5y+4=0$

- a. (-1,2), (-1,4)      b. (1,-2), (-1,4)      c. (1,2), (-1,-4)      d. (1,2), (-1,4)

37. The length of the tangent from the point (3,2) to the circle  $x^2+y^2-2x-3y+k=0$  is 9units. Find the value of k.

- a. 88      b. 81      c. 8      d. 80

38. Given the three circles  $x^2+y^2-16x+60=0$ ,  $x^2+y^2-12x+20=0$  and  $x^2+y^2-16x-12y+84=0$ . Find the length of each tangent.

- a. 4units      b. 1unit      c. 2units      d. 3units

39. Determine the two values of c for which the line  $3x+4y+c=0$  is a tangent to the circle  $x^2+y^2-6x-2y-15=0$

- a. -12 or 38      b. 12 or -38      c. -12 or -38      d. 12 or 38

40. Give Circles  $x^2+y^2-20x-14y+113=0$  and  $4x^2+4y^2+16x-16y-49=0$ . Find the length of the shortest distance from a point on one circle to a point on the other.

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