

TN Board Class 12 Maths Important Questions

1. Prove that the function $f(x) = x^2 - x + 1$ is neither increasing nor decreasing in $[0, 1]$.
2. Prove that the set of all 4th roots of unity forms an abelian group under multiplication.
3. Solve by matrix inversion method $x + y = 3$, $2x + 3y = 8$
4. What is the radius of the circle in which the sphere $x^2 + y^2 + z^2 + 2x - 2y - 4z - 19 = 0$ is cut by the plane $x + 2y + 2z + 7 = 0$.
5. Find the vector and cartesian equations to the plane through the point $(-1, 3, 2)$ and perpendicular to the plane $x + 2y + 2z = 5$ and $3x + y + 2z = 8$.
6. The path of a ship can be described by a hyperbolic model centered at the origin, relative to two stations on the shore 168 miles apart that are located at the foci. If the ship is 40 miles south of the centre of the hyperbola, find the equation of the hyperbola.
7. Derive the formula for the volume of a right circular cone with radius 'r' and height 'h' using integration.
8. A Bank pays interest by continuous compounding that is by treating the interest rate as the instantaneous rate of change of principal. Suppose in an account interest accrues at 8% per year compounded continuously. Calculate the percentage increase in such an account over one year.
9. Find the values of x, y whose product $xy = 64$ and such that $4x + 27y^3$ is maximum.
10. Find directrix, latus rectum of the ellipse $6x^2 + 9y^2 + 12x - 36y - 12 = 0$ also draw the diagram.
11. Out of 13 applications for a job, there are 8 men and 5 women. It is decided to select 2 persons for the job. Find the probability that atleast one of the selected person will be a woman.
12. Altitudes of a triangle are concurrent prove by vector method.
13. Find the axes, centre, focus and directrix of the parabola $y^2 - 6y - 8x + 25 = 0$.
14. The orbit of the earth around the sun is elliptical in shape with sun at a focus. The semi major axis is of length 92.9 million miles and eccentricity is 0.017. Find how close the earth gets to sun and the greatest possible distance between the earth and the sun.

15. Prove that the perpendicular bisectors of sides of a triangle are concurrent by vector method.
16. A Kho-Kho player in a practice session while running realises that the sum of the distances from the two Kho-Kho poles from him is always 8m. Find the equation of the path traced by him if the distance between the poles is 6m.
17. Find the cartesian equation of the plane passing through the point $(-1, 3, 2)$ and perpendicular to the planes $x + 2y + 2z = 5$, $3x + y + 2z = 8$. Also find the intercepts with the three coordinate axes made by the plane.
18. Show that the 6th roots of unity form an abelian group with usual multiplication.
19. The life of army shoes is normally distributed with mean 8 months and standard deviation 2 months. If 5000 pairs are issued, how many pairs would be expected to need replacement within 12 months.
20. Find the point on the parabola $x + y^2 = 0$ that is closest to the point $(0, -3)$.