1. Write the condition that the equation ax + by + c = 0 represents a non-vertical straight line. Also write its slope.
2. Transform the equation 4x-3y+ 12=0 into slope-intercept form and intercept form of a straight line.
3. Find the ratio in which the point C (6,-17,-4) divides the line segment joining the points A(2,3,4) and B(3,-2,2)
4. Find the interval in which f (x) = x^3 - $3x^2$ is decreasing.
5. Find the angle between the lines joining the origin to the points of intersection of the curve x^2 + 2xy + y^2+ 2x + 2y - 5 = 0 and the line 3 x -y + 1 = 0
6. Find the equation of locus of a point, the sum of whose distances from (0, 2) and (0, -2) is 6 units
7. Show that the origin is within the triangle whose angular points are (2,1), (3, -2) and (-4, 1)
8. Show that the line joining the points A (+6, -7, 0) and BC (16, -19, -4) intersects the line joining the points P(0,3,-6) and Q (2,-5, 10) at the point (1,-1,2)
9. Find the derivative of tan 2x from the first principles
10. Find the orthocentre of the triangle whose vertices are (5,-2), (-1,2) and (1,4)
11. Find the cube root of 37-30 $\sqrt{3}$
12. Find the area: of the triangle formed with the points A(1, 2, 3), B (2, 3, 1) and C (3, 1, 2) by vector method.
13. If f : A → B and g : B → C are bijections, then prove that gof : A → C is also bijection.
14. If A + B + C = 180°, then show that sin 2A - sin 2B + sin2C = 4 cos A sin B cos C
15. Find the value of x, if the slope of the line passing through (2, 5) and (x, 3) is 2.
16. Find the angle between the planes 2x-y+z=6 and x+y+2z=7
17. A (2, 3) and B (3, 4) be two given points. Find the equation of the Locus of P, so that the area of the Triangle PAB is 8.5 sq. units.
18. Find the points on the line 3x- 4 y-1= 0 which are at a distance of 5 units from the point (3, 2).
19. Find the derivative of sin 2x from the first principle.

20. A wire of length l is cut into two parts which are bent respectively in the form of a square and a circle. Find the lengths of the pieces of the wire, so that the sum of the areas is the least.