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J S U N I L T U T O R I A L

P U N J A B I C O L O N Y G A L I 0 1

10th

Sample paper Mathematics -7

Section A

1. Determine the value of k for which the equation $x^2 - 2(1 + 3k)x + 7(3 + 2k) = 0$ has equal roots.
2. Find the sum of integers between 100 and 700 which on dividing by 11 leave a remainder 7
3. Sum of n terms of an AP are given by $5n^2 - 3n$. Find the AP and its 20th term.
4. If the mth term of an AP is 1/n and n^{th} term is 1/m. Find $(m\ n)^{th}$ term of this AP
5. How many terms of the AP 43, 39, 35 …. Must be taken so that their sum is 252.
6. Find k if 3k +2, 4k +3 and 6k – 1 are in AP
7. Ramesh borrowed Rs 40,000 and promised to pay in 12 monthly instalments in the following way 4200, 4250, 4300 …. Find the amount of the 11th instalment
8. The angles of a triangle are in AP, the least being half the greatest. Find the angles.
9. The length of a line segment is 10. If one end is at (2, -3) and the abscissa of the second end is 10. Show that its ordinate is either 3 or -9.

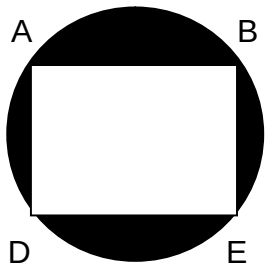
Section B

10. Show that (7, 10), (-2, 5) and (3, -4) are the vertices of an isosceles right triangle.
11. Find the coordinates of the points which trisect the line joining (1, -2) and (-3, 4)
12. Find the ratio in which the point (-1, k) divides the line joining (-3,10) and (6, -8). Hence find the value of k.
13. Three vertices of a parallelogram are A(1, 2), B(2, 3) and C(6, 5). Find the fourth vertex.
14. Find the coordinates of the points which divide the line joining the points (-2, 0) and (0, 8) in four equal parts.
15. Find the length of medians of a triangle having vertices (0, -1), B(2, 1) and C(0, 3).
16. The line segment joining the points (3, -4) and (1, 2) is trisected at the points (a, -2) and Q (5/3, b), find the values of a and b.

17. A tree stands vertically on the bank of a river. From a point on the other bank directly opposite the tree, the angle of elevation of the top of the tree is 60°. From a point 20m behind this point on the same bank, the angle of elevation of the top of the tree is30°. Find the height of the tree and the width of the river.
18. From the top of a cliff 60meters high, the angles of depression of the top and bottom of a tower are observed to be 45° and 60° respectively. Find the height of the tower.

Section C

19. A pole 5m high is fixed at the top of a tower. The angle of depression of the top of the pole observed from a point A on the ground is 60° and the angle of depression of the point A from the top of the tower is 45°. Find the height of the tower.
20. In figure, PA and PB are the tangents to the circle drawn from the external point P, CD is another tangent touching the circle at Q. If PB = 10 cm, (i) find the perimeter of ∆PCD. (ii) prove that PA = ½ perimeter of ∆PAD (iii) Prove PC + CQ = PD + DQ
21. Prove that the tangent at any point of a circle is perpendicular to the radius through the point of contact. Using above find: two concentric circles are of radii 10cm and 6cm. Find the length of the chord of the larger circle which touches the smaller circle.
22. Two circles touch externally. The sum of their areas is 149∏ cm2 and the distance between their centers is 17cm. Find the radii of the circles.
23. A copper wire when bent in the form of a square encloses an area of 484 cm2. If the same wire is bent in the form of a circle, find the area enclosed by it.
24. The cost of fencing a circular field at the rate of Rs. 16 per meter is Rs. 3014.4.The field is to be ploughed at the rate of Rs. 0.40 per m2. Find the cost of ploughing the field. (∏ = 3.14)
25. The inner circumference of a circular track is 220m. The track is 7m wide everywhere. Calculate the cost of putting a fence along the outer circle at the rate of Rs 2 per meter.



26. The wheels of a car are of diameter 70cm each. How many complete revolutions does each wheel make in one minute when the car is traveling at a speed of 52.8 km per hour?
27. Find the area of the shaded region if AB = 8cm and BC = 6cm The radius of a metallic sphere is 9cm. The sphere is melted and drawn into a wire of uniform circular cross-section. If the length of the wire is 243m, Find the radius of the cross-section.
28. Water is flowing at the rate of 5km per hour through a pipe of diameter 14cm into a rectangular tank which is 25m long and 22m wide. Determine the time in which the water level rises by 21cm.

Section D

29. How many spherical balls each of 5cm in diameter can be cast from a rectangular block of metal 11dm x 10dm x 5 dm.
30. A well whose diameter is 4m, has been dug 18m deep and the earth taken out is used to form an embankment 8m wide around it. Find the height of the embankment.
31. The internal and external diameters of a hollow hemispherical shell are 6cm and 10cm respectively. It is melted and recast into a solid cone of base diameter 14cm. Find the height of the cone so formed.
32. The largest sphere is carved out of a cube of edge p units. Find the volume.
33. A bucket of height 16cm and made up of metal sheet is in the form of frustum of a cone with radii of its lower and upper ends are 3cm and 15cm respectively: Calculate (i) Volume of water that can be filled (ii) the slant height of the bucket (iii) area of metal sheet required
34. The slant height of the frustum of a cone is 4cm and the circumferences of its circular ends are 18cm and 6cm. Find curved surface area of the frustum.