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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

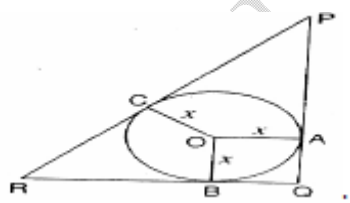
Sample paper Mathematics -6

Section A

1. The value of k for which the equation $x^2 + 2(k+1)x + k^2 = 0$ has equal roots is
   (a) -1 (b)-1/2 c) 1 (d) none of these Ans. b
2. In AP consist of 31 terms if its 16th term is m, then sum of all the terms of this AP is
   (a) 16 m (b) 47 m (c) 31 m (d) 52 m Ans. c
3. Rahim and karim are friends. What is the probability that both have their birthdays on the same day in a non-leap year? (a) 1/365 (b)1/7(c)1/53(d)7/ 365 Ans. A
4. Q.4 A quadrilateral ABCD is drawn to circumscribe a circle. If AB = 12cm , BC= 15cm and CD= 14cm, then AD is equal to (a) 10cm (b) 11cm (c) 12cm (d) 14cm Ans b
5. The circumferences of two concentric circles forming a ring are 88 cm and 66 cm respectively. The width of the ring is (a) 14 cm (b) 7 cm (c) 7/2 cm (d) 21 cm Ans c
6. If two consecutive vertices of a rhombus are (2,–1), (3, 4) and intersection point of its diagonal are (0 , 1) , then the remaining two vertex are
   (a) (–3,–2) & (–2, 3) (b) (3,2)&(–2, 3) (c) (–3,–2) &(2,3) (d) (1, 2)&(–3,–2) Ans. a
7. The difference between circumference and the radius of a circle is 37m. the circumference of that circle is
   (a) 7m (b) 44m (c) 154m (d) 77m Ans b
8. Two tangents TP and TQ are drawn from an external point T to a circle with centre O .If they are inclined to each other at an angle of 100^0 then what is the value of $\angle POQ$?
   (a) 70 (b) 60 (c) 80 (d) none of these Ans c
9. If α ,β are the roots of the equation $x^2 + kx + 12 = 0$ such that α –β =1, the value of k is :
   (a) 0 (b) ± 5 (c) ±1 (d) ± 7 Ans .d
10. If the height of a tower is half the height of the flagstaff on it and the angle of elevation of the top of the tower as seen from a point on the ground is 30^0. Then the angle of elevation of the top of the flagstaff as seen from the same point is
    (a) 30^0 (b) 45^0 (c) 90^0 (d) 60^0. Ans d

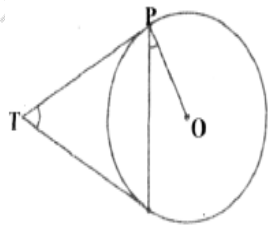
Section B

11. How many spherical bullets can be made out of a solid cube of lead whose edge measures 44 cm, each bullet being 4 cm in diameter. Ans 2541
12. One root of the equation $2x^2 - 8x + m = 0$ is 5/2. Find the other root and the value of m. Ans m=15/2 α =3/2
13. A pendulum swings through an angle of 30^0 and describes an arc 8.8 cm in length. Find the length of the pendulum. Ans L = 16. 8 cm
14. A bag contains 5 red balls and some white balls. If the probability of drawing a white ball is double that of red ball, find the number of white balls in the bag. Ans nu. Of white balls = 10
15. The ordinate of a point is twice its abscissa. Find the coordinates of the point if its distance from (4,3) is 10. Ans (1, 2) (3, 6)
16. In given figure PQR is a right angled triangle with PQ = 12 cm and QR = 5 cm. A circle with centre and radius x is inscribed in ΔPQR. Find the value of x. Ans r = 2



OR.

Two tangents TP and TQ are drawn to a circle with centre O from an external Point T. Prove that ∠PTQ = 2 ∠OPQ.



17. Using quadratic formula, solve the following quadratic equation for x: $x^2 - 4ax + 4a^2 - b^2 = 0$

Ans $\{2a + b, 2a - b\}$

18. Prove that the coordinates of the centroid of a ΔABC with vertices A($x1$, $y1$), B($x2$, $y2$) and C ($x3$, $y3$) are given by $\frac{x1+x2+x3}{3}, \frac{y1+y2+y3}{3}$

Section C

19. A letter is chosen at random from the English alphabet. Find the probability that the letter chosen (a) is a vowel,(b) is a consonant (c) precedes P (d) follower r. Ans.(a)5/26 (b) 21/26 (c) 15/26 (d) 4/13
20. Determine the common difference of the AP whose sum of m terms is x m^2 + y m Ans. a = x + y & d = 2x

    OR, Prove that sum of n term of A. P. is $S_n = {}^n/2\ [2a + (n-1)\ d]$
21. 50 circular plates, each of radius 7 cm and thickness ½ cm are placed one above another to form a solid right circular cylinder. Find the total surface area and the volume of the cylinder so formed. Ans. 1408 sq cm

    OR

    A hemispherical tank of radius 1 ¾ m is full of water. It is connected with a pipe which empties it at the rate of 7 litres per second. How much time will it take to empty the tank completely? Ans.1604.16 sec = 26.73 minutes
22. A brooch is made with silver wire in the form of a circle with diameter 35 mm. The wire is also used in making 5 diameters which divide the circle into 10 equal sectors as shown in Fig10.1 Find : (i) the total length of the silver wire required. (ii) the area of each sector of the brooch. Ans (i) 285 mm (ii) *Area* = 385/4 mm^2

OR

The area of an equilateral triangle is 1732. 05 cm^2 taking each vertex as centre; a circle is drawn with radius equal to half the length of the side of the triangle. Find the area of the triangle not Included in the circles. (Take $\pi = 3.14$ & $\sqrt{3} = 1.73205$). Ans. r = 100 cm side of square = 200 cm & area = 1620. 51 sq cm

23. From the top of a lighthouse, the angles of depression of two ships on its two sides are observed to be α and β. If the height of the lighthouse is h meters and the line joining the ships passes through the foot of the lighthouse, show that the distance between the ships is $\frac{h(tan\alpha + \tan\beta}{tan\alpha\ tan\beta}$
24. Using A (4,-6), B (3,-2) and C (5, 2), verify that a median of the triangle ABC divides it into two triangles of equal areas.
25. P Q is a chord of length 8 cm of a circle of radius 5 cm. The tangent at P & Q intersect at a point T. Find the length of TP. Ans TP = 20 / 3 Cm
26. Which term of the sequences 114,109,104 ……is the first negative term? Ans n = 24th term

27. If centre of circle passing through (a,–8), (b,–9) and (2,1) is (2,–4), find the value of a and b. Ans a = 5,-1 b = 2
28. Prove that the parallelogram circumscribing a circle is a rhombus

Section D

29. If the equation $(1+m^2)x^2 + 2mcx + (c^2 - a^2) = 0$ has equal roots, prove that $c^2 = a^2(1+m^2)$.

OR

Out of a number of Saras birds, one forth the number are moving about in lotus plants ; 1/9 th coupled (along) with ¼ as well as 7 times the square root of the number move on a hill ; 56 birds remain in vakula trees. What is the total number of birds? Ans Total number of birds = 576

30. If $S_1 S_2 S_3$ be the sum of n, 2n and 3n terms respectively of an A.P. prove that $S_3 = 3(S_2 - S_1)$
31. A vessel is in the form of a hollow hemisphere mounted by a hollow cylinder. The diameter of the hemisphere is 14 cm and the total height of the vessel is 13 cm. Find its capacity Ans: V = 4928/3= 1642.66 cm^3
32. Draw a triangle ABC with side BC = 7cm, $\angle B = 450$, $\angle A = 1050$, then construct a triangle whose sides are 3 /5 times the corresponding side of ΔABC.
33. A copper wire 4 mm in diameter is evenly bound about a cylinder whose length is 24 cm and diameter 20 cm so as to cover the whole surface. Find the length of the wire in terms of π Ans :Length of wire = 1200π
34. A man standing on the deck of a ship, which is 10m above the water level, observes the angle of elevation of the top of a hill as 60^0 and the angle of depression of the base of the hill as 30^0. Calculate the distance of the hill from the ship and the height of the hill. Ans: d =10 3 =17.32;h = 40m

Or,

The angle of elevation of a jet fighter from a point A on the ground is 60^0. After a flight of 15seconds, the angle of elevation changes to 30^0. If the jet is flying at a speed of 720 km/hour, find the constant height at which the jet is flying. Ans: 1500 √3*m*= 2598