

AADHARSHILA STUDIES

CBSE-SAMPLE PAPER

CLASS X(Mathematic)

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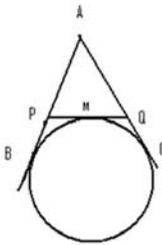
General Instructions:

- (i) All questions are compulsory.
 - (ii) There are 34 questions divided into 4 sections – A, B, C and D. Section A comprises of ten questions of 01 mark each, Section B comprises of eight questions of 02 marks each, Section C comprises of ten questions of 03 marks each and Section D comprises of six questions of 04 marks each.
 - (iii) Internal choice has been provided in one question of 02 marks each, three questions of 03 marks each and two questions of 04 mark each.
 - (iv) Use of calculators is not permitted, but mathematical tables may be used.
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SECTION –A

Select the correct alternative from four choices in each question:-

1. The value(s) of 'k' for which the equation $(k+1)x^2 - 2kx + 2x + 1 = 0$ has real and equal roots are:
(i) 2, 1 (ii) $0, \frac{3}{4}$ (iii) 0, 1 (iv) 0, 3
2. The first negative term of sequence $20, \frac{77}{4}, \frac{37}{2}, \frac{71}{4}, \dots$ is:
(i) 27th (ii) 28th (iii) 29th (iv) 26th
3. AB, AC and PQ are tangents as shown in the following figure. If AB = 5cm, then perimeter of ΔAPQ is:



- (i) 10cm (ii) 15cm (iii) 12.5cm (iv) 20cm
4. In a right triangle ABC, right angle at B, BC = 6cm and AB = 8cm. A circle is inscribed in ΔABC . The radius of the circle is:
(i) 1 cm (ii) 2 cm (iii) 3cm (iv) 4cm

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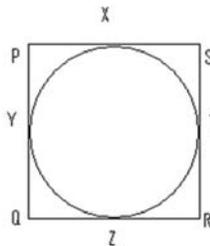
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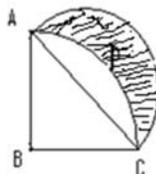
5. The length of tangent drawn from a point P to a circle of radius 3cm is 4cm .The distance of point P from the centre of the circle is :
- (i) 7 cm (ii) 25 cm (iii) 5cm (iv) $\sqrt{7}$ cm
6. To divide a line segment AB in the ratio 5 : 7, first a ray AX is drawn so that $\angle BAX$ is an acute angle and then at equal distances points are marked on the ray AX such that the minimum number of these points is :
- (i) 8 (ii) 12 (iii) 10 (iv) 11
7. If the sum of areas of two circles with radii R_1 and R_2 is equal to the area of the circle of radius R, then
- (i) $R_1^2 + R_2^2 = R^2$ (ii) $R_1 + R_2 = R$ (iii) $R_1 + R_2 < R$ (iv) $R_1^2 + R_2^2 < R^2$
8. If the perimeter of a circle is equal to that of a square, then the ratio of their areas is
- (i) 22 : 7 (ii) 7 : 22 (iii) 14 : 11 (iv) 11 : 14
9. The length of the shadow of a pillar is $\sqrt{3}$ times its height. The angle of elevation of the source of light is :
- (i) 60° (ii) 30° (iii) 45° (iv) 90°
10. A card is drawn from a pack of 52 cards. The event E is the card drawn is not an ace of heart. The number of outcomes favorable to E is:
- (i) 13 (ii) 51 (iii) 3 (iv) 49

SECTION – B

11. Solve for x : $6a^2x^2 - 7abx - 3b^2 = 0$, $a \neq 0$.
12. Find the 10th term from the end of the A.P. 8, 10, 12,....., 126.
13. A quadrilateral PQRS is drawn so as to circumscribe a circle as shown in the figure given below. Prove that $PS + QR = PQ + RS$.



14. ABCP is a quadrant of a circle of radius 14 cm. With AC with AC as diameter a semicircle is drawn. Find the area of the shaded region.



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15. A sphere of radius 10.5 cm is melted and then recast into smaller cones of radius 3.5 cm and height 3 cm. Find the number of cones.
16. Find the ratio in which the line segment joining the points A (3,-6) and B (5, 3) is divided by x-axis. Also find the co-ordinates of the point of intersection.

OR

Find a relation between x and y such that the point (x, y) is equidistant from the points A(2, 5) and B(-3, 7).

17. A and B are points (1, 2) and (2, 3). Find the co-ordinates of a point P on the line segment AB such that $AP = \frac{3}{7} AB$.
18. It is known that in a box of 600 screws, 12 screws are defective. One screw is taken out at random from this box. Find the probability that it is a good screw.

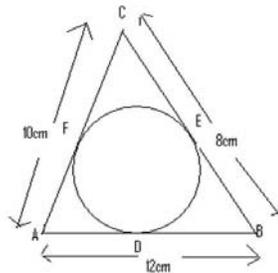
SECTION-C

19. The sum of first 3 terms of an A.P. is 33. If the product of the first and the third term exceeds the second term by 29, find the A.P.

OR

How many terms of the A.P. 9, 17, 25... must be taken to give the sum 636?

20. Find the sum of all two digit natural numbers which are divisible by 4.
21. A circle is inscribed in a triangle ΔABC having sides 8 cm, 10 cm and 12 cm as shown in the figure given below. Find AD, BE and CF.



22. Draw a pair of tangents to circle of radius 4 cm which are inclined to each other at an angle of 60° . Write also steps of construction.

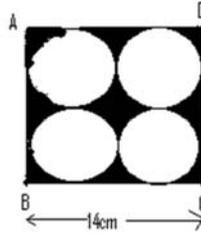
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23. Find the area of shaded region in the figure given below, where ABCD is a square of side 14 cm.



24. A hemispherical bowl of internal diameter 30 cm contains a liquid. The liquid is to be filled into cylindrical shaped bottles of diameter 5cm and height 6cm. How many bottles are necessary to empty the bowl?
25. A 10 cm high flagstaff is fixed on the top of a tower. The angle of elevation of the top of the flagstaff as observed from a point P on the ground is 60° . The angle of depression of the point from the top of the tower is 45° . Find the height of the tower.
26. Points A (5,-1), B (-3, 2) and C (-1, 8) are vertices of a ΔABC . Find the length of the median from A. Also find the co-ordinates of the centroid of this triangle.
27. The line segment joining the points (2, 1) and (5, -8) is trisected at the points P and Q. If P lies on the line $2x - y + k = 0$, find the value of 'k'.
28. A bag contains 11 white balls and some red balls. If the probability of drawing a red ball is double that of a white ball, find the number of red balls in the bag.

SECTION-D

29. A piece of cloth costs Rs 200. If the piece were 5 m longer, and each meter of cloth cost Rs 2 less, the cost of the piece would have remained unchanged. How long is the piece and what is its original rate per meter?

OR

Two water taps together can fill a tank in $9\frac{3}{8}$ hrs. The larger tap takes 10 hours less than the smaller one to fill the tank separately. Find the time in which each tap can separately fill the tank.

30. If (-5) is a root of the quadratic equation $2x^2 + px - 15 = 0$ and the quadratic equation $p(x^2 + x) + k = 0$ has equal roots, then find the values of p and k.

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31. Prove that the lengths of tangents drawn from an external point to a circle are equal.
Using the above theorem, prove the following:
PA and PB are two tangents drawn to a circle with centre O, from an external point P.
Prove that $\angle APB = 2\angle OAB$.
32. If the radii of the circular ends of a conical bucket, which is 45 cm high, are 28 cm and 7cm. Find the capacity and curved surface area of the bucket.
33. The angle of elevation of an aero plane from a point A on the ground is 60° . After a flight of 30 seconds, the angle of elevation changes to 30° . If the plane is flying at a constant height of $3600\sqrt{3}$ m, find the speed, in km/hour, of the plane.
- OR
- The angle of elevation of the cloud from a point 60 m above lake is 30° and the angle of depression of the reflection of the cloud in the lake is 60° . Find the height of the cloud.
34. A tent is in the shape of a cylinder surmounted by a conical top. If the height and diameter of the cylindrical part are 2.1 m and 4 m respectively and the slant height of the top is 2.8 m, find the area of the canvas used for making the tent. Find the cost of the canvas of the tent at the rate of Rs 500 per m^2 . Also find the volume of air enclosed in the tent.
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