

Ashwani Gupta



Class – X

Mathematics

Section – ‘A’

- If the equation $x^2 + 4x + k = 0$ has real and distinct roots, then:
(a) $k < 4$ (b) $k > 4$
(c) $k \geq 4$ (d) $k \leq 4$
- The 8th term from the end of the A.P. 7,10,13, ...,184 is:
(a) 163 (b) –163
(c) 152 (d) –152
- The number of solid spheres, each of diameter 6cm that could be moulded to form a solid metal cylinder of height 45cm and diameter 4cm is:
(a) 3cm (b) 4cm
(c) 5cm (d) 6cm
- Find the length of the tangent drawn from a point whose distance from the centre of the circle is 25cm. If the radius of the circle is 7cm:
(a) 2cm (b) 16cm
(c) 24cm (d) 21cm
- If TP and TQ are two tangents to a circle with centre O so that $\angle POQ = 110^\circ$, then $\angle PTQ$ is equal to:
(a) 60° (b) 70°
(c) 80° (d) 90°
- AB and CD are two common tangents to circles which touch each other at C. If D lies on AB such that $CD = 4\text{cm}$, then AB is equal to:
(a) 4cm (b) 6cm
(c) 8cm (d) 12cm
- A sphere of radius 6cm is dropped into a cylindrical vessel partly filled with water. The radius of the vessel is 8cm. If the sphere is submerged completely, then the surface of the water rises by:
(a) 4.5cm (b) 3cm
(c) 4cm (d) 2cm
- A solid is hemispherical at the bottom & conical above. If the surface areas of two parts are equal, then the ratio of its radius & the height of its conical part is:
(a) 1:3 (b) $1:\sqrt{3}$



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- (c) 1:1 (d) $\sqrt{3}:1$
9. The ratio of the length of a rod & its shadow is $1:\sqrt{3}$. The angle of elevation of the sun is:
(a) 30° (b) 45°
(c) 60° (d) 90°
10. From a well-shuffled pack of cards, a card is drawn at random. The probability of getting a black queen is:
(a) $\frac{1}{26}$ (b) $\frac{2}{13}$
(c) $\frac{11}{13}$ (d) $\frac{1}{13}$

Section - 'B'

11. If -5 is a root of the quadratic equation $2x^2 + px - 15 = 0$ & the quadratic equation $p(x^2 + x) + k = 0$ has equal roots, find the value of k .
12. The 10th term of an Arithmetic Progression (A.P.) is 44 & its 15th term is 64. Find the A.P.
13. If all the sides of a parallelogram touch a circle, prove that the ||gm is a rhombus.
14. An umbrella has 8 ribs which are equally spaced (Assuming umbrella to be a flat circle) of radius 45 cm, find the area between the two consecutive ribs of the umbrella.
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15. A *fez*, the cap used by the Turks, is shaped like the frustum of a cone. If its radius on the open side is 10 cm, radius at the upper base is 4 cm and its slant height is 15 cm, find the area of material used for making it.
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16. Determine the ratio in which the point $(-6, a)$ divides the join of $A(-3, -1)$ & $B(-8, 9)$. Also find the value of a .
17. Prove that the points $A(0,1)$, $B(1,4)$, $C(4,3)$ & $D(3,0)$ are the vertices of *square*.
18. A box contains 90 discs which are numbered from 1 to 90. If one disc is drawn at random from the box, find the probability that it bears (i) a two-digit number (ii) a perfect square number (iii) a number divisible by 5.

Or

Find the probability of getting a head when a coin is tossed once. Also find the probability of getting a tail.

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Section - 'C'

19. The sum of the squares of three consecutive positive integers is 50. Find the integers.

Or

A two-digit number is such that the product of its digits is 35. When 18 are added to the number, the digits interchange their places. Find the number.

20. Find the number of terms of an A. P. : 54, 51, 48,..... So that their sum is 513.

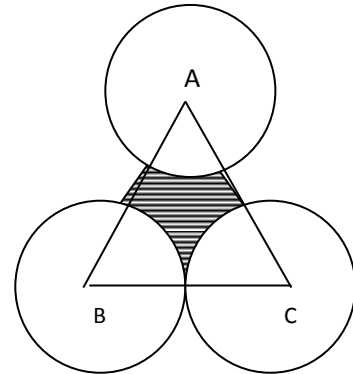
21. Two circles touch internally at a point P & from a point T on the common tangent at P, tangent segments TQ, TR are drawn to the two circles. Prove that $TQ = TR$.

Or

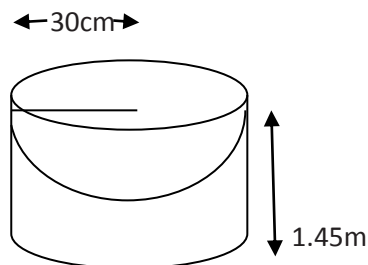
PQ & PR are tangents to a circle with centre O. If $\angle OPR = 80^\circ$, find $\angle QOR$.

22. Construct an isosceles triangle whose base is 8 cm and altitude 4 cm and then another triangle whose sides are $1\frac{1}{2}$ times the corresponding sides of the isosceles triangle.

23. The area of an equilateral triangle ABC is 17320.5 cm^2 . With each vertex of the triangle as centre, a circle is drawn with radius equal to half the length of the side of the triangle. Find the area of the shaded region. (Use $\pi=3.14$ and $\sqrt{3} = 1.73205$)



24. Mayank made a bird-bath for his garden in the shape of a cylinder with a hemispherical depression at one end. The height of the cylinder is 1.45 m and its radius is 30 cm. Find the total surface area of the bird-bath



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A copper rod of diameter 1 cm and length 8 cm is drawn into a wire of length 18 m of uniform thickness. Find the thickness of the wire.

25. A person standing on the bank of a river observes that angle of elevation of the top of a tree standing on the opposite bank is 60° . When he moves 40m away from the bank, he finds the angle of elevation to be 30° . Find the height of the tree and the width of the river.
26. The co-ordinates of two vertices A & B of an $\triangle ABC$ are $(1,4)$ & $(5,3)$ respectively. If the co-ordinates of the centroid of $\triangle ABC$ are $(3,3)$, find the co-ordinates of the third vertex C .
27. Prove that $(2, -2)$, $(-2,1)$ & $(5,2)$ are vertices of a right angled triangle. Find the area of the triangle & the length of the hypotenuse.
28. A pair of dice is thrown once; find the probability:
 1. of getting a total of 11.
 2. of product of them is 6.

Section - 'D'

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

Or

The area of right angled triangle is 600sq.cm . If the base of the triangle exceeds the altitude by 10cm, find the dimensions of the triangle.

30. The sum of 3 nos. in A. P. is 27 and their product is 405. Find the nos.
31. A circle touches all the four sides of a quadrilateral ABCD whose sides are $AB = 6\text{cm}$, $BC = 7\text{cm}$ and $CD = 4\text{cm}$. Find AD.
32. Water is flowing at the rate of 3km/hr through a circular pipe of 20cm internal diameter into a circular cistern of diameter 10m and depth 2m. In how much time will the cistern be filled?

Or

The cost of painting the total outside surface of a closed cylindrical oil tank 60p per sq. dm is Rs. 237.60. The height of tank is 6 times the radius of the base of the tank. Find its volume.

33. 500 persons took dip in a rectangular tank which is 80m long and 50m broad. What is the rise in the level of water in the tank, if the average displacement of water by a person is 0.04m^3 ?
34. A man standing on the deck of the ship, which is 10m above water level, observes the angle of elevation of the top of a hill as 60° & the angle of depression of the base of the hill as 30° . Find the distance of the hill from the ship & the height of the hill.

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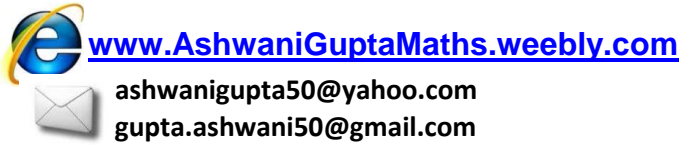
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