

CBSE Previous Year Question Papers Class 10 Maths

2014

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Time allowed: 3 hours

marks: 90

Maximum

GENERAL INSTRUCTIONS:

1. All questions are compulsory.
2. The Question Taper consists of 31 questions divided into four Sections A, B, C. and D.
3. Section A contains 4 questions of 1 mark each. Section B contains 6 questions of 2 marks each, Section C contains 10 questions of 3 marks each and Section D contains 11 questions of 4 marks each. 4. Use of calculators is not permitted.

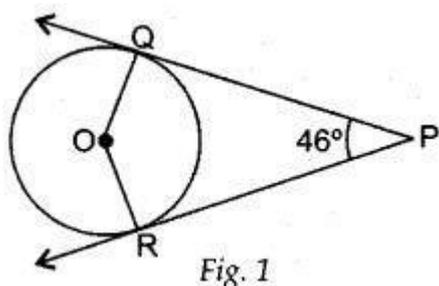
SET I

SECTION A

Questions number 1 to 4 carry 1 mark each.

Question.1 In Fig. 1, PQ and PR are two tangents to a circle with centre O. If $\angle QPR = 40^\circ$

$= 46^\circ$, then calculate $\angle QOR$.



question. 2 If two different dice are rolled together, calculate the probability of getting an even number on both dice.

Question.3 If the points $A(x, 2)$, $B(-3, -4)$ and $C(7, -5)$ are collinear, then find the value of x .

Question.4 Find the number of solid spheres, each of diameter 6 cm that can be made by melting a solid metal cylinder of height 45 cm and diameter 4 cm.

SECTION B

Questions number 5 to 10 carry 2 marks each.

Question.5 Solve the quadratic equation $2x^2 + ax - a^2 = 0$ for x .

Question.6 The first and the last terms of an AP are 5 and 45 respectively. If the sum of all its terms is 400, find its common difference.

Question.7 Prove that the line segment joining the points of contact of two parallel tangents of a circle, passes through its centre.

Question.8 If from an external point P of a circle with centre O , two tangents PQ and PR are drawn such that $\angle QPR = 120^\circ$, prove that $2PQ = PO$.

Question.9 Rahim tosses two different coins simultaneously. Find the probability of getting at least one tail.

Question.10 In Fig. 2, a square $OABC$ is inscribed in a quadrant $OPBQ$ of a circle. If

OA = 20 cm, find the area of the shaded region. (Use $\pi = 3.14$)

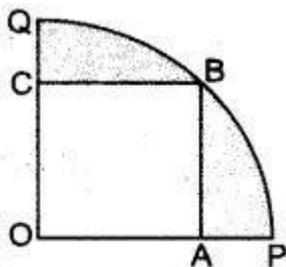


Fig. 2

SECTION C

Questions number 11 to 20 carry 3 marks each.

Question.11 Solve the equation

$$\frac{4}{x} - 3 = \frac{5}{2x+3}; x \neq 0, -\frac{3}{2}, \text{ for } x.$$

Question.12 If the seventh term of an AP is $\frac{1}{2}$ and its ninth term is $\frac{1}{7}$ find its 63rd term.

Question.13 Draw a right triangle ABC in which AB = 6 cm, BC = 8 cm and $\angle B = 90^\circ$.

Draw BD perpendicular from B on AC and draw a circle passing through the points B, C and D. Construct tangents from A to this circle.

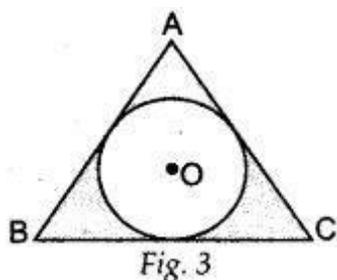
Question.14 If the point A(0, 2) is equidistant from the points B(3, p) and C(p, 5), find p. Also find the length of AB.

Question.15 Two ships are there in the sea on either side of a light house in such a way that the ships and the light house are in the same straight line. The angles of depression of two ships as observed from the top of the light house are 60° and 45° . If the height of the light house is 200 m, find the distance between the two ships. [Use $\sqrt{3} = 1.73$]

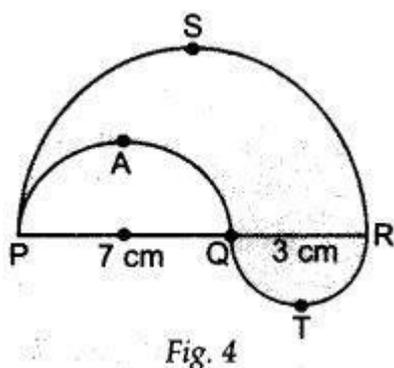
Question.16 If the points A(-2,1), B(a, b) and C(4, -1) are collinear and $a - b = 1$, find the values of a and b.

Question.17 In Fig. 3, a circle is inscribed in an equilateral triangle ABC of side 12 cm. Find the radius of inscribed circle and the area of the shaded region. [Use $\pi =$

3.14 and $\sqrt{3} = 1.73$]



Question.18 In Fig. 4, PSR, RTQ and PAQ are three semicircles of diameters 10 cm, 3 cm and 7 cm respectively. Find the perimeter of the shaded region. [Use $\pi = 3.14$]



Question.19 A farmer connects a pipe of internal diameter 20 cm from a canal into a cylindrical tank which is 10 m in diameter and 2 m deep. If the water flows through the pipe at the rate of 4 km per hour, in how much time will the tank be filled completely?

Question.20 A solid metallic right circular cone 20 cm high and whose vertical angle is 60° , is cut into two parts at the middle of its height by a plane parallel to its base. If the frustum so obtained be drawn into a wire of diameter $\frac{1}{2}$ cm, find the length of the wire.

SECTION D

Questions number 21 to 31 carry 4 marks each.

Question.21 The difference of two natural numbers is 5 and the difference of their reciprocals is $\frac{1}{10}$ Find the numbers.

Question.22 Prove that the length of the tangents drawn from an external point to a circle are equal.

Question.23 The angles of elevation and depression of the top and the bottom of a tower from the top of a building, 60 m high, are 30° and 60° respectively. Find the difference between the heights of the building and the tower and the distance between them.

Question.24 A bag contains cards numbered from 1 to 49. A card is drawn from the bag at random, after mixing the cards thoroughly. Find the probability that the number on the drawn card is:

(i) an odd number

(ii) a multiple of 5

(iii) a perfect square

(iv) an even prime number

Question.25 Find the ratio in which the point $P(x, 2)$ divides the line segment joining the points $A(12, 5)$ and $B(4, -3)$. Also find the value of x .

Question.26 Find the values of k for which the quadratic equation $(k + 4)x^2 + (k + 1)x + 1 = 0$ has equal roots. Also find these roots.

Question.27 In an AP of 50 terms, the sum of first 10 terms is 210 and the sum of its last 15 terms is 2565. Find the AP.

Question.28 Prove that a parallelogram circumscribing a circle is a rhombus.

Question.29 Sushant has a vessel, of the form of an inverted cone, open at the top, of height 11 cm and radius of top as 2.5 cm and is full of water. Metallic spherical balls each of diameter 0.5 cm are put in the vessel due to which $\frac{2}{5}$ th of the water in the vessel flows out. Find how many balls were put in the vessel. Sushant made the arrangement so that the water that flows out irrigates the flower beds.

What value has been shown by Sushant?

Question.30 From a solid cylinder of height 2.8 cm and diameter 4.2 cm, a conical cavity of the same height and same diameter is hollowed out. Find the total surface area of the remaining

solid. [Take $\pi = 22/7$]

Question.31 A peacock is sitting on the top of a pillar, which is 9 m high. From a point 27 m away from the bottom of the pillar, a snake is coming to its hole at the base of the pillar. Seeing the snake the peacock pounces on it. If their speeds are equal, at what distance from the hole is the snake caught?

SET II

Note: Except for the following questions, all the remaining questions have been asked in Set I.

Question.10 The first and last terms of an AP are 7 and 49 respectively. If sum of all its terms is 420, find its common difference.

Question.18 Solve the equation

$$\frac{3}{x+1} - \frac{1}{2} = \frac{2}{3x-1}; x \neq -1, x \neq \frac{1}{3}, \text{ for } x.$$

Question.19 Points A(-1, y) and B(5, 7) lie on a circle with centre O(2, -3y). Find the values of y. Hence find the radius of the circle.

Question.20 If the points P(-3,9), Q(a, b) and R(4, -5) are collinear and $a + b = 1$, find the values of a and b.

Question.27 The difference of two natural numbers is 3 and the difference of their reciprocals is

Find the numbers.

Question.28 Prove that the tangent at any point of a circle is perpendicular to the radius through the point of contact.

Question.29. All the black face cards are removed from a pack of 52 playing cards. The remaining cards are well shuffled and then a card is drawn at random. Find the probability of getting a:

(i) face card

(ii) red card

(iii) black card

(iv) king

Question.30 Find the values of k for which the quadratic equation $(3k + 1)x + 2(k + 1)x + 1 = 0$ has equal roots. Also find the roots.

SET III

Note: Except for the following questions, all the remaining questions have been asked in Set I and Set II.

Question.10 The first and the last terms of an AP are 8 and 65 respectively. If the sum of all its terms is 730, find its common difference.

Question.18 If the points $A(-1, -4)$, $B(b, c)$ and $C(5, -1)$ are collinear and $2b + c = 4$, find the values of b and c .

Question.19 If the point $P(2, 2)$ is equidistant from the points $A(-2, k)$ and $B(-2k, -3)$, find k . Also find the length of AP.

Question.20 Solve the equation

$$\frac{14}{x+3} - 1 = \frac{5}{x+1}; x \neq -3, -1, \text{ for } x.$$

Question.27 Find the value of p for which the quadratic equation $(2p + 1)x^2 - (7p + 2)x + (7p - 3) = 0$ has equal roots. Also find these roots.

Question.28 Cards numbered from 11 to 60 are kept in a box. If a card is drawn at random from the box, find the probability that the number on the drawn card is :

(i) an odd number

(ii) a perfect square number

(iii) divisible by 5

(iv) a prime number less than 20

Question.29 Prove that the tangent at any point of a circle is perpendicular to the radius through the point of contact.

Question.30 The difference of two natural numbers is 5 and the difference of their reciprocals is $\frac{5}{14}$. Find the numbers.

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