

CBSE Class 10 Maths
Short Answer Type Questions (3 Marks)
Term 2 Exam 2022

Chapter - Quadratic Equations

1. Find two consecutive positive integers, the sum of whose squares is 365.
2. If 2 is a root of the equation $x^2 + bx + 12 = 0$, find the value of 'b' and find the other root.
3. Find two numbers whose sum is 27 and product is 182.
4. Solve: $x + 1/x = 3$ ($x \neq 0$)
5. Find the roots of the quadratic equation: $3x^2 - 2\sqrt{6}x + 2 = 0$
6. The altitude of a right triangle is 7 cm less than its base. If the hypotenuse is 13 cm, find the other two sides.
7. Find the value of p, for which one root of the quadratic equation $px^2 - 14x + 8 = 0$ is 6 times the other
8. Find the value of k, for which the quadratic equation $(k-12)x^2 + 2(k-12)x + 2 = 0$ has equal roots
9. Find the discriminant of the equation $3x^2 - 2x + 1/3 = 0$ and hence write the nature of its roots. Find them, if they are real.
10. Three consecutive natural numbers are such that the square of the middle number exceeds the difference of the squares of the other two by 60. Find the numbers

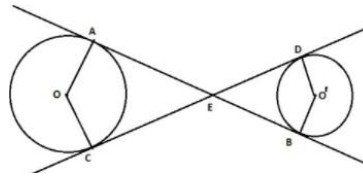
Chapter - Arithmetic Progressions

1. If the 3rd and 9th term of an A.P. are 4 and -8 respectively, then which term of this A.P. is zero?
2. The first three terms of an A.P. are $3y-1$, $3y+5$ and $5y+1$ respectively then find y.
3. The fifth term of an A.P. is 20 and the sum of its seventh and eleventh terms is 64. Find the common difference.
4. Find whether 100 is a term of the A.P. 20, 28, 36, ...
5. How many two-digit numbers are divisible by 7?
6. If the ratio of the sums of first n terms of two A.P.'s is $(7n+1) : (4n+27)$, find the ratio of their m^{th} terms.
7. Find the sum of all odd numbers between 0 and 50.
8. If m^{th} term of an A.P. is $1/n$ and n^{th} term is $1/m$, find the sum of first mn terms.
9. How many terms of the A.P. 24, 21, 18, ... must be taken so that their sum is 78?
10. Find the number of natural numbers between 101 and 999 which are divisible by both 2 and 5.

Chapter - Circles

1. If an angle between two tangents drawn from a point P to a circle of radius 'a' and centre O is 60° , then prove that $AP = a\sqrt{3}$.

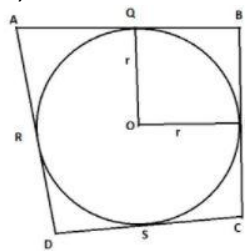
2. In the figure, common tangents AB and CD to two circles with centre O and O' intersect at E. Prove that AB = CD.



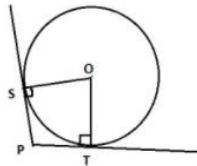
3. If all the sides of a parallelogram touch a circle, then prove that the parallelogram is a rhombus.

4. XY and X'Y' are two parallel tangents to a circle with centre O and another tangent AB with point of contact C, intersecting XY at A and X'Y' at B, is drawn. Prove that $\angle AOB = 90^\circ$.

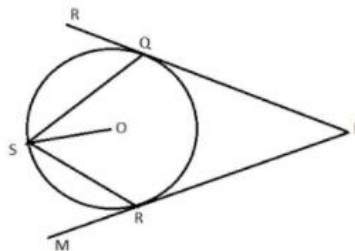
5. In the figure, a circle is inscribed in a quadrilateral ABCD in which $\angle B = 90^\circ$. If AD = 23 cm, AB = 29 cm and DS = 5 cm, find the radius of the circle.



6. In figure tangent segments PS and PT are drawn to a circle with centre O such that $\angle SPT = 120^\circ$. Prove that $OP = 2PS$.



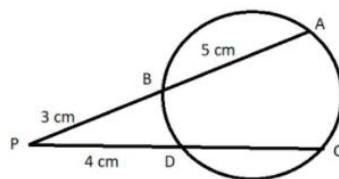
7. In fig. 3, PQ and PR are tangents to the circle with centre O and S is a point on the circle such that $\angle SQR = 50^\circ$ and $\angle SRM = 60^\circ$. Find $\angle QSR$.



8. Two tangents TP and TQ are drawn to a circle with centre O from an external point T. Prove that $\angle PTQ = 2\angle OPQ$.

9. PA and PB are the two tangents to a circle with centre O in which OP is equal to the diameter of the circle. Prove that APB is an equilateral triangle.

10. In fig. Chords AB and CD intersect at P. If AB = 5 cm, PB = 3 cm and PD = 4 cm. Find the length of CD.



Chapter - Constructions

1. Draw a line segment AB of length 7 cm. Taking A as centre, draw a circle of radius 3 cm and taking B as centre, draw another circle of radius 2 cm. Construct tangents to each circle from the centre of the other circle .
2. Construct a pair of tangents to a circle of radius 4 cm from a point which is at a distance of 6 cm from its centre.
3. Draw a line segment of length 8 cm and divide it internally in the ratio 4:5.
4. Draw two concentric circles of radii 3 cm and 5 cm. Construct a tangent to smaller circle from a point on the larger circle. Also measure its length.
5. Draw a circle of radius 3 cm. From a point P, 7 cm away from its centre draw two tangents to the circle. Measure the length of each tangent.
6. Construct two tangents PT and PQ to a circle of radius 4 cm and centre O such that $\angle TOQ = 120^\circ$.
7. To a circle of radius 5 cm, draw two tangents which are inclined to each other at an angle of 60° .
8. Draw a circle of radius 3.5 cm. Draw two tangents to the circle which are perpendicular to each other.
9. Draw a line segment of 6 cm and divide it in the ratio 3:2.
10. Draw a line segment AB of length 7 cm. Using a ruler and compasses, find a point P on AB such that $AP/PB = 3/5$.

Chapter - Some Applications Of Trigonometry

1. From a point on the ground, the angles of elevation of the bottom and top of a water tank kept on the top of the 30 m high building are 30° and 45° respectively. Find the height of the water tank?
2. From the top of a multi-storeyed building, 90m high, the angles of depression of the top and the bottom of a tower are observed to be 30° and 60° respectively. Find the height of the tower?
3. Two ships are there in the sea on either side of a lighthouse in such a way that the ships and the base of the lighthouse are in the same straight line. The angles of depression of two ships as observed from the top of the lighthouse are 60° and 45° . If the height of the lighthouse is 200m, find the distance between the two ships. (Use $\sqrt{3} = 1.73$)
4. From the top of a 300 metre high light-house, the angles of depression of two ships, which are due south of the observer and in a straight line with its base, are 60° and 30° . Find their distance apart?
5. A Statue, 1.6 m tall, stands on the top of a pedestal. From a point on the ground, the angle of elevation of the top of the statue is 60° and from the same point, the angle of elevation of the top of the pedestal is 45° . Find the height of the pedestal? (Use $\sqrt{3} = 1.73$)
6. A peacock is sitting on the top of a tree. It observes a serpent on the ground making an angle of depression of 30° . The peacock with the speed of 300 metre/minute catches the serpent in 12 seconds. What is the height of the tree?
7. An aero plane, at an altitude of 1200 m, finds that two ships are sailing towards it in the same direction. The angles of depression of the ships as observed from the aeroplane are 60° and 30° respectively. Find the distance between the two ships?

8. If the angles of elevation of the tops of two statues of heights m_1 and m_2 are 60° and 30° respectively from the mid-point of the line segment joining their feet, then find the ratio $m_1 : m_2$?

9. From the top of a 7m high building, the angle of elevation of the top of a cable tower is 60° and the angle of depression of its foot is 45° . Determine the height of the tower?

10. The angle of elevation of the top of a hill from the foot of a tower is 60° and the angle of elevation of the top of the tower from the foot of the hill is 30° . If the tower is 50 m high, find the height of the hill?

Chapter - Surface Areas and Volumes

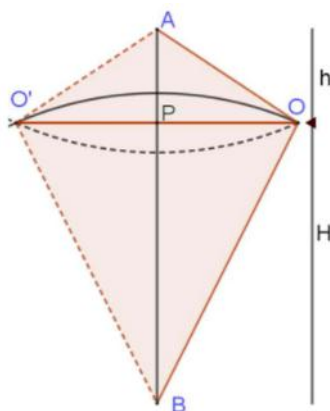
1. 12 Solid spheres of the same size are made by melting a solid metallic cone of base radius 1cm and height of 48 cm. Find the radius of each sphere.

2. Two cubes each of volume 27 cm^3 are joined end to end to form a solid. Find the surface area of the resulting cuboid.

3. Find the number of plates 1.5 cm in diameter and 0.2 cm thick can be fitted completely inside a right circular cylinder of height 10 cm and diameter 4.5 cm

4. A cylindrical glass tube with radius 10 cm has water up to a height of 9 cm. A metal cube of 8 cm edge is immersed completely. By how much water level will rise in the glass tube?

5. A solid metallic object is shaped like a double cone as shown in figure. Radius of base of both cones is same but their heights are different. If this cone is immersed in water, find the quantity of water it will disperse.



6. If the areas of three adjacent faces of a cuboid are X, Y and Z respectively, then find the volume of the cuboid.

7. Find the volume (in cm^3) of the largest right circular cone that can be cut off from a cube of edge 4.2 cm.

8. A wooden article was made by scooping out a hemisphere of radius 7 cm, from each end of a solid cylinder of height 10 cm and diameter 14 cm. Find the total surface area of the article (use $\pi = 22/7$)

9. A heap of rice is in the form of a cone of base diameter 24 m and height 3.5 m. Find how much canvas cloth is required to just cover the heap?

10. A toy is in the shape of a solid cylinder surmounted by a conical top. If the height and diameter of the cylindrical part are 21 cm and 40 cm respectively, and the height of cone is 15 cm, then find the total surface area of the toy.(use $\pi = 3.14$)

Chapter - Statistics

1. Daily wages of a factory workers are recorded as follows. Find the mode of the given distribution.

Daily wages	131-136	137-142	143-148	149-154	155-160
No of workers	5	27	20	18	12

2. Find the median of the following distribution.

Marks obtained	0-10	10-20	20-30	30-40	40-50	50-60
Number of Students	8	10	12	22	30	18

3. The median of the following data is 525. Find the missing frequency x .

CLASS	FREQUENCY
0-100	2
100-200	5
200-300	x
300-400	12
400-500	17
500-600	20
600-700	15
700-800	9
800-900	7
900-1000	4

4. The following data gives the information on the observed life times (in hours) of 150 electrical components. Find the mode of the distribution.

Life time (in hours)	0-20	20-40	40-60	60-80	80-100
Frequency	15	10	35	50	40

5. Determine the missing frequency x , from the following data, when mode is 67.

Class	40-50	50-60	60-70	70-80	80-90
Frequency	5	x	15	12	7

7. The mean of the following distribution is 48 and the sum of all frequencies is 50. Find the missing frequencies.

Class	20-30	30-40	40-50	50-60	60-70
Frequency	8	6	x	11	y

8. Find the mean of the following distribution by appropriate method.

Class	20-30	30-40	40-50	50-60	60-70
Frequency	25	40	42	33	10