MATHS

BOOKS - CBSE MODEL PAPER

SAMPLE PAPER 2022 TERM II

Section A

1. Find the roots of the quadratic equation $3x^2 - 7x - 6 = 0$.

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2. Find the values of k for which the quadratic

equation $3x^2 + kx + 3 = 0$ has real and

equal roots.

A. 3 and 2

B.

C.

D.

Answer:

3. Three cubes each of volume $64cm^3$ are joined end to end to form a cuboid. Find the total surface area of the cuboid so formed?

A. $125cm^2$

B. $115cm^2$

C. $225cm^2$

D. $224cm^2$

Answer: D

4. An inter house cricket match was organized by a school. Distribution of runs made by the students is given below. Find the median runs scored.

Runs scored	0-20	20-40	40-60	60-80	80-100
Number of students	4	6	5	3	4

5. Find the common difference of the AP 4,9,14,... If the first term changes to 6 and the common difference remains the same then write the new AP.
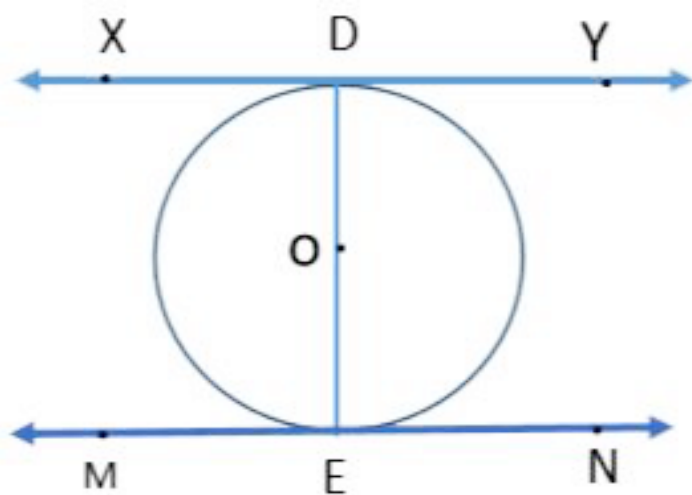
6. The mode of the following frequency distribution is 38. Find the value of x.

Class Interval	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	7	9	12	16	x	6	11

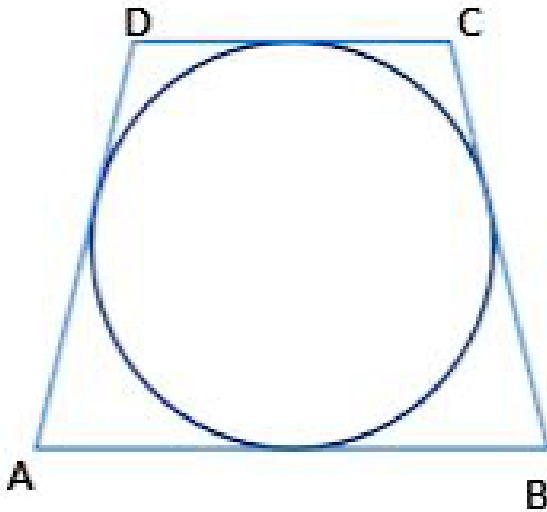**7.** XY and MN are the tangents drawn at the end points of the diameter DE of the circle with centre O. Prove that XY || MN.

8. In the given figure, a circle is inscribed in the quadrilateral ABCD. Given AB=6cm, BC=7cm and CD=4cm. Find AD.

9. Find the value of $a_{25} - a_{15}$ for the AP: 6, 9, 12, 15, ...

10. If 7 times the seventh term of the AP is equal to 5 times the fifth term, then find the value of its 12th term.

A. 4

B. 2

C. 0

D. None

Answer: C

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11. Find the value of m so that the quadratic

equation $mx(5x - 6) = 0$ has two equal
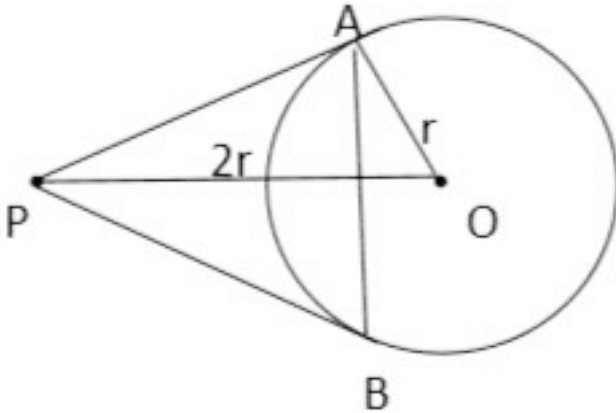
roots.

A. 1

B. -1

C. 0

D. None

Answer: C

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12. From a point P, two tangents PA and PB are

drawn to a circle C(0, r). If OP = 2r, then find

$\angle APB.$ What type of triangle is APB?

A. scalene

B. equilateral

C. isosceles

D. None

Answer: B

13. The curved surface area of a right circular cone is $12320 cm^2$. If the radius of its base is 56cm, then find its height.

14. Mrs. Garg recorded the marks obtained by her students in the following table. She calculated the modal marks of the students of

the class as 45. While printing the data, a blank was left. Find the missing frequency in the table given below

Marks Obtained	0 - 20	20 - 40	40 - 60	60 - 80	80 - 100

Number of Students	5	10	---	6	3

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15. If Ritu were younger by 5 years than what she really is, then the square of her age would

have been 11 more than five times her present age. What is her present age?

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16. Solve for x: $9x^2 - 6px + \left(p^2 - q^2\right) = 0$

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Section B

1. An AP 5, 8, 11...has 40 terms. Find the last term. Also find the sum of the last 10 terms.

2. A tree is broken due to the storm in such a way that the top of the tree touches the ground and makes an angle of $30°$ with the ground. Length of the broken upper part of the tree is 8 meters. Find the height of the tree before it was broken.

3. Two poles of equal height are standing opposite each other on either side of the road 80m wide. From a point between them on the road the angles of elevation of the top of the two poles are respectively $60°$ and $30°$. Find the distance of the point from the two poles.

4. PA and PB are the tangents drawn to a circle

with centre O. If PA= 6 cm and $\angle APB = 60°$,

then find the length of the chord AB.
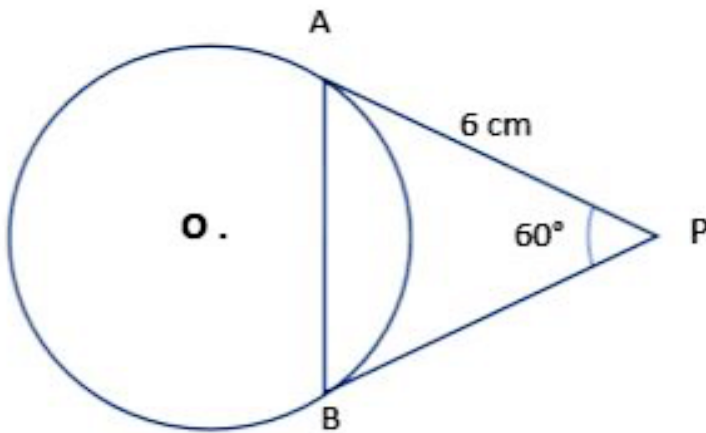
A. 6 cm

B. 2 cm

C. 5 cm

D. 3 cm

Answer: A

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5. The sum of the squares of three positive numbers that are consecutive multiples of 5 is 725. Find the three numbers.

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6. Following is the distribution of the long jump competition in which 250 students participated. Find the median distance jumped by the students. Interpret the median

Distance (in m)	0 - 1	1 - 2	2 - 3	3 - 4	4 - 5
Number of Students	40	80	62	38	30

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7. Construct a pair of tangents to a circle of radius 4cm, which are inclined to each other at an angle of $60°$.

8. The distribution given below shows the runs scored by batsmen in one-day cricket matches. Find the mean number of runs.

Runs scored	0 - 40	40 - 80	80 - 120	120 - 160	160 - 200
Number of batsmen	12	20	35	30	23

9. Two vertical poles of different heights are standing 20m away from each other on the

level ground. The angle of elevation of the top of the first pole from the foot of the second pole is $60°$ and angle of elevation of the top of the second pole from the foot of the first pole is$30°$. Find the difference between the heights of two poles. (Take$\sqrt{3} = 1.73$)

A. 23.06

B. 26

C. 24

D. None

Answer: A

10. A boy 1.7 m tall is standing on a horizontal ground, 50 m away from a building. The angle of elevation of the top of the building from his eye is $60°$. Calculate the height of the building. (Take$\sqrt{3} = 1.73$)

Section C

1. Construct two concentric circles of radii 3cm and 7cm. Draw two tangents to the smaller circle from a point P which lies on the bigger circle.

2. Draw a pair of tangents to a circle of radius 6cm which are inclined to each other at an angle of $60°$. Also find the length of the tangent.

3. The following age wise chart of 300 passengers flying from Delhi to Pune is prepared by the Airlines staff.

Age	Less than 10	Less than 20	Less than 30	Less than 40	Less than 50	Less than 60	Less than 70	Less than 80
Number of passengers	14	44	82	134	184	245	287	300

Find the mean age of the passengers.

A. 45

B. 42

C. 41.7

D. 25

Answer: C

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4. A lighthouse is a tall tower with light near the top. These are often built on islands, coasts or on cliffs. Lighthouses on water surface act as a navigational aid to the mariners and send warning to boats and ships for dangers. Initially wood, coal would be used

as illuminators. Gradually it was replaced by candles, lanterns, electric lights. Nowadays they are run by machines and remote monitoring.

Prongs Reef lighthouse of Mumbai was constructed in 1874-75. It is approximately 40 meters high and its beam can be seen at a distance of 30 kilometres. A ship and a boat are coming towards the lighthouse from opposite directions. Angles of depression of flash light from the lighthouse to the boat and the ship are $30°$ and $60°$ respectively.
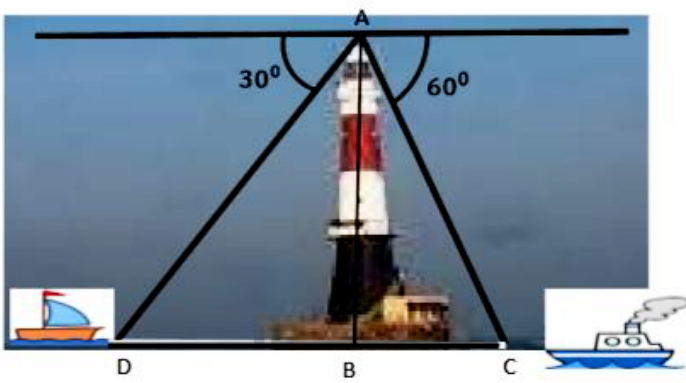
Find the mean age of the passengers.

i) Which of the two, boat or the ship is nearer to the light house. Find its distance from the lighthouse?

ii) Find the time taken by the boat to reach the light house if it is moving at the rate of 20 km per hour.

5. Krishnanagar is a small town in Nadia District of West Bengal. Krishnanagar clay dolls are unique in their realism and quality of their finish. They are created by modelling coils of clay over a metal frame. The figures are painted in natural colours and their hair is made either by sheep's wool or jute. Artisans make models starting from fruits, animals, God, goddess, farmer, fisherman, weavers to Donald Duck and present comic characters. These creations are displayed in different national and international museums.

Doll-1　　Doll-2　　Doll-3　　Doll-4

The ratio of diameters of red spherical apples in Doll-1 to that of spherical oranges in Doll-2 is 2:3. In Doll-3, male doll of blue colour has cylindrical body and a spherical head. The spherical head touches the cylindrical body. The radius of both the spherical head and the cylindrical body is 3cm and the height of the cylindrical body is 8cm. Based on the above information answer the following questions:

i) What is the ratio of the surface areas of red

spherical apples in Doll-1 to that of spherical oranges in Doll-2.?

ii) The blue doll of Doll-3 is melted and its clay is used to make the cylindrical drum of Doll-4. If the radius of the drum is also 3cm, find the height of the drum.

6. The internal and external radii of a spherical shell are 3cm and 5cm respectively. It is melted and recast into a solid cylinder of diameter

14cm, find the height of the cylinder. Also find the total surface area of the cylinder.
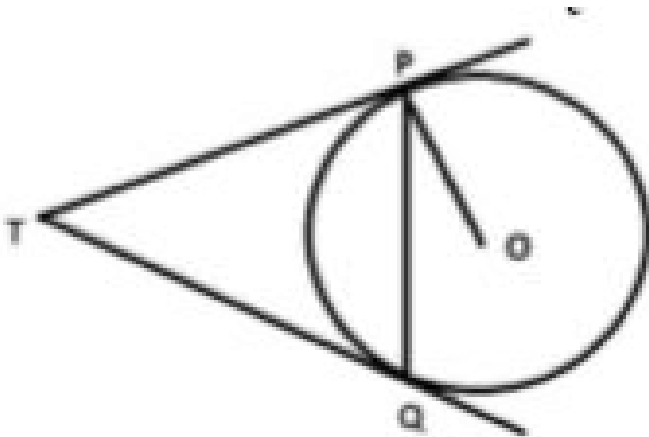
(Take $\pi = \dfrac{22}{7}$)

7. Prove that the angle between the two tangents drawn from an external point to a circle is supplementary to the angle subtended by the line segment joining the points of contact to the centre.

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. Case Study-1

Trigonometry in the form of triangulation forms the basis of navigation, whether it is by land, sea or air. GPS a radio navigation system helps to locate our position on earth with the help of satellites.

A guard, stationed at the top of a 240m tower, observed an unidentified boat coming towards it. A clinometer or inclinometer is an instrument used for measuring angles or slopes(tilt). The guard used the clinometer to measure the angle of depression of the boat

coming towards the lighthouse and found it to be $30°$.

(Lighthouse of Mumbai Harbour. Picture credits - Times of India Travel)

i) Make a labelled figure on the basis of the given information and calculate the distance of the boat from the foot of the observation tower.

ii) After 10 minutes, the guard observed that the boat was approaching the tower and its distance from tower is reduced by $240(\sqrt{3} - 1)$m. He immediately raised the alarm. What was the new angle of depression of the boat from the top of the observation tower?

10. Case Study-2

Push-ups are a fast and effective exercise for

building strength. These are helpful in almost all sports including athletics. While the push-up primarily targets the muscles of the chest, arms, and shoulders, support required from other muscles helps in toning up the whole body.

Nitesh wants to participate in the push-up challenge. He can currently make 3000 push-ups in one hour. But he wants to achieve a target of 3900 push-ups in 1 hour for which he practices regularly. With each day of practice,

he is able to make 5 more push-ups in one hour as compared to the previous day. If on first day of practice he makes 3000 push-ups and continues to practice regularly till his target is achieved. Keeping the above situation in mind answer the following questions:

i) Form an A.P representing the number of push-ups per day and hence find the minimum number of days he needs to practice before the day his goal is accomplished?

ii) Find the total number of push-ups

performed by Nitesh up to the day his goal is

achieved.

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