

10th CBSE MATHEMATICS

2012-13

1 SECTION A

1.1. The roots of the quadratic equation $2x^2 - x - 6 = 0$ are :

- a) $-2, 3/2$
- b) $2, -3/2$
- c) $-2, 3/2$
- d) $2, 3/2$

1.2. If the n^{th} term of an A.P. is $(2n + 1)$, then the sum of its first three terms is

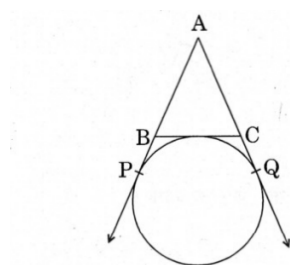
- a) $6n + 3$
- b) 15
- c) 12
- d) 21

1.3. From a point Q , 13cm away from the centre of a circle, the length of tangent PQ to the circle is 12cm . The radius of the circle (in cm) is

- a) 25
- b) $\sqrt{313}$
- c) 5
- d) 1

1.4. In Fig. 1, AP , AQ and BC are tangents of the circle. If $AB = 5\text{cm}$, $AC = 6\text{cm}$ and $BC = 4\text{cm}$, then the length of AP (in cm) is

- a) 7.5



- b) 15

- c) 10

- d) 9

1.5. The circumference of a circle is 22cm . The area of its quadrant (in cm^2) is

- a) $\frac{77}{2}$

- b) $\frac{77}{4}$

- c) $\frac{77}{8}$

- d) $\frac{77}{16}$

1.6. A solid right circular cone is cut into two parts at the middle of its height by a plane parallel to its base. The ratio of the volume of the smaller cone to the whole cone is

- a) 1 : 2

- b) 1 : 4

- c) 1 : 6

- d) 1 : 8

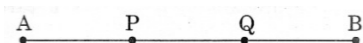
1.7. A kite is flying at a height of 30 m from the ground. The length of string from the kite to the ground is 60m . Assuming that there is no slack in the string, the angle of elevation of the kite at the ground is

- a) 45°
- b) 30°
- c) 60°
- d) 90°

1.8. The distance of the point $(-3, 4)$ from the x-axis is

- a) 3
- b) -3
- c) 4
- d) 5

1.9. In Fig. 2, $P(5, -3)$ and $Q(3, y)$ are the points of trisection of the line segment joining $A(7, -2)$ and $B(1, -5)$. Then y equals.



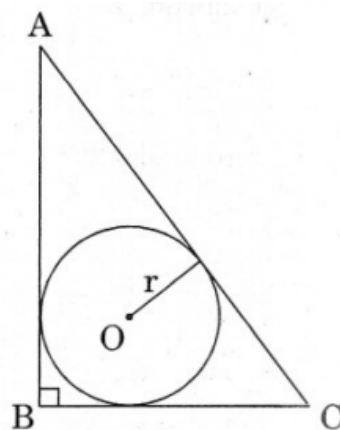
- a) 2
 - b) 4
 - c) -4
 - d) $-\frac{5}{2}$
- 1.10. Cards bearing numbers 2, 3, 4, ..., 11 are kept in a bag. A card is drawn at random from the bag. The probability of getting a card with a prime number is
- a) $\frac{1}{2}$
 - b) $\frac{2}{5}$
 - c) $\frac{3}{10}$
 - d) $\frac{5}{9}$

2 SECTION B

2.1. Find the value of p for which the roots of the equation $px(x - 2 + 6) = 0$, are equal.

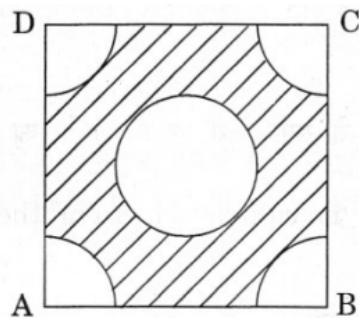
2.2. How many two-digit natural numbers are divisible by 3?

2.3. In Fig. 3, a right triangle ABC , circumscribes a circle of radius r . If AB and BC are of lengths 8cm and 6cm respectively, find the value of r .



2.4. Prove that the tangents drawn at the ends of a diameter of a circle are parallel.

2.5. In Fig. 4, $ABCD$ is a square of side 4cm . A quadrant of a circle of radius 1cm is drawn at each vertex of the square and a circle of diameter 2cm is also drawn. Find the area of the shaded region. (Use $\pi = 3.14$)



OR

From a rectangular sheet of paper $ABCD$ with $AB = 40\text{cm}$ and $AD = 28\text{cm}$, a semi-circular portion with BC as diameter is cut off. Find the area of the remaining paper. (Use $\pi = \frac{22}{7}$)

2.6. A solid sphere of radius 10.5cm is melted and recast into smaller solid cones, each of radius 3.5cm and height 3cm . Find the number of cones so formed. (Use $\pi = \frac{22}{7}$)

2.7. Find the value of k , if the point $P(2, 4)$ is equidistant from the points $A(5, k)$ and $B(k, 7)$.

2.8. A card is drawn at random from a well-shuffled pack of 52 cards. Find the probability of getting

- a red king
- a queen or a jack

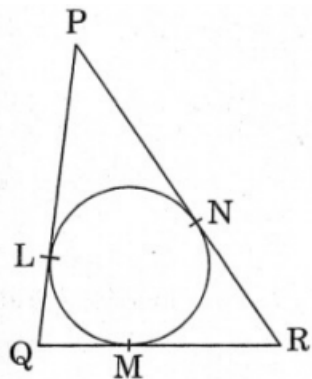
3 SECTION C

3.1. Solve the following quadratic equation for x :
 $x^2 - 4ax - b^2 + 4a^2 = 0$

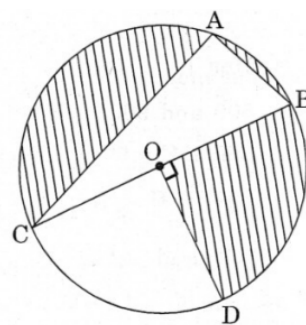
3.2. Find the sum of all multiples of 7 lying between 500 and 900.

3.3. Draw a triangle ABC with $BC = 7\text{cm}$, $\angle B = 45^\circ$ and $\angle C = 60^\circ$. Then construct another triangle, whose sides are times the corresponding sides of $\triangle ABC$.

3.4. In Fig. 5, a circle is inscribed in a triangle PQR with $PQ = 10\text{cm}$, $QR = 8\text{cm}$ and $PR = 12\text{cm}$. Find the lengths QM , RN and PL .



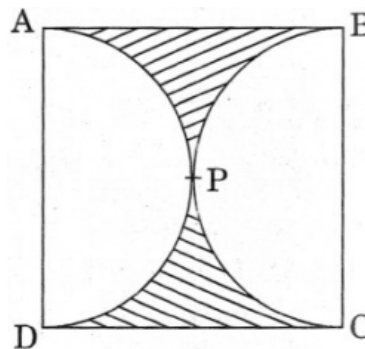
3.5. In Fig. 6, is the centre of the circle with $AC = 24\text{cm}$, $AB = 7\text{cm}$ and $\angle BOD = 90^\circ$. Find the area of the shaded region. (Use



$$\pi = 3.14)$$

OR

In Fig. 7, find the area of the shaded region, if $ABCD$ is a square of side 14cm and APD and BPC are semicircles.



3.6. A hemispherical bowl of internal radius 9cm is full of water. Its contents are emptied in a cylindrical vessel of internal radius 6cm . Find the height of water in the cylindrical vessel.

3.7. The angles of depression of the top and bottom of a tower as seen from the top of a $60\sqrt{3}\text{m}$ high cliff are 45° and 60° respectively. Find the height of the tower.

3.8. Find the coordinates of a point P , which lies on the line segment joining the points $A(-2, -2)$ and $B(2, -4)$ such that $AP = \frac{3}{7} AB$.

OR

Find the area of the quadrilateral $ABCD$ whose vertices are $A(-3, -1)$, $B(-2, -4)$,

$C(4, -1)$ and $D(3, 4)$.

- 3.9. All kings, queens and aces are removed from a pack of 52 cards. The remaining cards are well shuffled and then a card is drawn from it. Find the probability that the drawn card is
- a black face card
 - a red card
- 3.10. The numerator of a fraction is 3 less than its denominator. If 1 is added to the denominator, the fraction is decreased by $\frac{1}{15}$. Find the fraction.

OR

In a flight of 2800 km, an aircraft was slowed down due to bad weather. Its average speed is reduced by 100 km/h and time increased by 30 minutes. Find the original duration of the flight.

- 3.11. Find the common difference of an $A.P.$ whose first term is 5 and the sum of its first four terms is half the sum of the next four terms.
- 3.12. Prove that the length of tangents drawn from an external point to a circle are equal.
- 3.13. A hemispherical tank, full of water, is emptied by a pipe at the rate of $\frac{25}{7}$ litres per sec. How much time will it take to empty half the tank if the diameter of the base of the tank is $3m$?

OR

A drinking glass is in the shape of the frustum of a cone of height $14cm$. The diameters of its two circular ends are $4cm$ and $2cm$. Find the capacity of the glass. (Use $\pi = \frac{22}{7}$)

- 3.14. A military tent of height $8 : 25$ m is in the form of a right circular cylinder of base diameter $30m$ and height $5.5m$ surmounted by a right circular cone of same base radius. Find the length of the canvas used in making the tent, if the breadth of the canvas is $1.5m$.
- 3.15. The angles of elevation and depression of the top and bottom of a light-house from the top of a $60m$ high building are 30° and 60° respectively. Find

- the difference between the heights of the light-house and the building.
- the distance between the light-house and the building