

# CBSE Maths Question Paper Class10 (2009)

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Get latex-tikz codes from

[https://github.com/Venkatasaidhilli/IITH/tree/main/CBSE\\_Class10](https://github.com/Venkatasaidhilli/IITH/tree/main/CBSE_Class10)

## 1 SECTION A

- 1) Find the [ HCF x LCM ] for the numbers 100 and 190.
- 2) If 1 is a zero of the polynomial  $p(x) = ax^2 - 3(a-1)x - 1$ , then find the value of a.
- 3) In  $\triangle LMN$ ,  $\angle L = 50^\circ$  and  $\angle N = 60^\circ$ . If  $\triangle LMN \sim \triangle PQR$  then find  $\angle Q$ .
- 4) If  $\sec^2\theta(1 + \sin\theta)(1 - \sin\theta) = k$ , then find the value of k.
- 5) If the diameter of a semicircular protractor is 14 cm, then find its perimeter.
- 6) Find the number of solutions of the following pair of linear equations.  

$$\begin{aligned} x + 2y - 8 &= 0 \\ 2x + 4y &= 16 \end{aligned}$$
- 7) Find the discriminant of the quadratic equation  

$$3\sqrt{3}x^2 + 10x + \sqrt{3} = 0$$
- 8) If  $\frac{4}{5}$ , a, 2 are three consecutive terms of an A.P, then find the value of a.
- 9) In Figure 1,  $\triangle ABC$  is circumscribing a circle. Find the length of BC.
- 10) Two coins are tossed simultaneously. Find the probability of getting exactly one head.

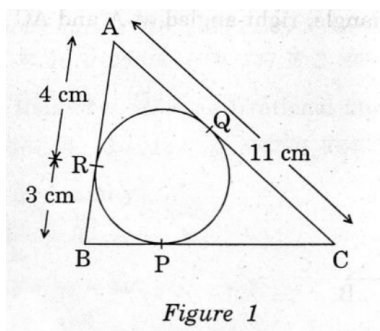


Figure 1

## 2 SECTION B

- 11) Find all the zeroes of the polynomial  $x^3 + 3x^2 - 2x - 6$ , if two of its zeros are  $-\sqrt{2}$  and  $\sqrt{2}$ .
- 12) Which term of the A.P. 3, 15, 27, 39, ... will be 120 more than its 21<sup>st</sup> term?
- 13) In Figure 2,  $\triangle ABD$  is a right triangle, right-angled at A and  $AC \perp BD$ . Prove that  $AB^2 = BC \cdot BD$ .

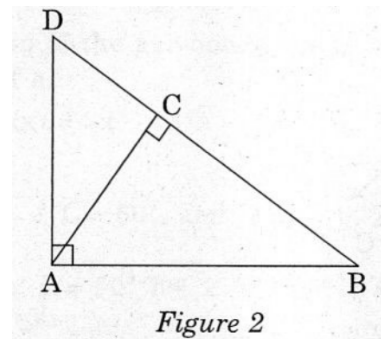


Figure 2

- 14) If  $\cot\theta = \frac{15}{8}$  then evaluate  $\frac{(2+2\sin\theta)(1-\sin\theta)}{(1+\cos\theta)(2-2\cos\theta)}$   
OR  
Find the value of  $\tan 60^\circ$ , geometrically.
- 15) If the points A (4, 3) and B (x, 5) are on the circle with the centre O (2, 3), find the value of x

## 3 SECTION C

- 16) Prove that  $3 + \sqrt{2}$  is an irrational number.
- 17) Solve for x and y:

$$\begin{aligned} \frac{ax}{b} - \frac{by}{a} &= a + b \\ ax - by &= 2ab \end{aligned}$$

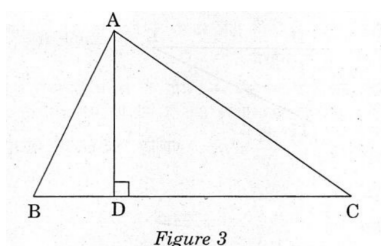
- 18) The sum of first six terms of an arithmetic progression is 42. The ratio of its 10<sup>th</sup> term to its 30<sup>th</sup> term is 1:3. Calculate the first and the thirteenth term of the A.P.

- 19) evaluate:

$$\frac{2}{3}\operatorname{cosec}^2 58^\circ - \frac{2}{3}\cot 58^\circ \tan 32^\circ - \frac{5}{3}\tan 13^\circ \tan 37^\circ \tan 45^\circ \tan 53^\circ \tan 77^\circ$$

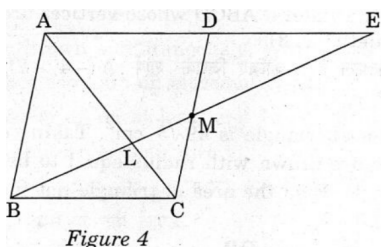
- 20) Draw a right triangle in which sides (other than hypotenuse) are of lengths 8 cm and 6 cm. Then construct another triangle whose sides are  $\frac{3}{4}$  times the corresponding sides of the first triangle.

- 21) In Figure 3,  $AD \perp BC$  and  $BD = \frac{1}{3}$ . Prove that  $2CA^2 = 2AB^2 + BC^2$ .



OR

In Figure 4, M is mid-point of side CD of a parallelogram ABCD. The line BM is drawn intersecting AC at L and AD produced at E. Prove that  $EL = 2 BL$ .



- 22) Find the ratio in which the point (2, y) divides the line segment joining the points A (-2, 2) and B (3, 7). Also find the value of y.
- 23) Find the area of the quadrilateral ABCD whose vertices are A (-4, -2), B (-3, -5), C (3, -2) and D (2, 3).
- 24) The area of an equilateral triangle is  $49\sqrt{3}\text{cm}^2$ . Taking each angular point as centre, circles are drawn with radius equal to half the length of

the side of the triangle. Find the area of triangle not included in the circles. [Take  $\sqrt{3} = 1.73$ ]

OR

Figure 5 shows a decorative block which is made of two solids — a cube and a hemisphere. The base of the block is a cube with edge 5 cm and the hemisphere, fixed on the top, has a diameter of 4.2 cm. Find the total surface area of the block. [Take  $\pi = \frac{22}{7}$ ]

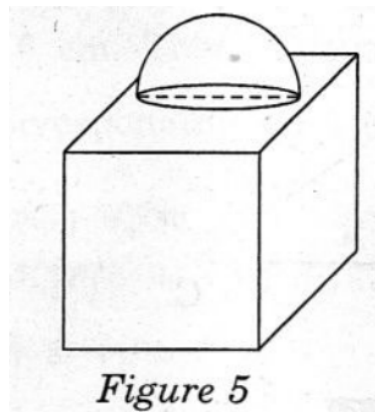


Figure 5

- 25) Two dice are thrown simultaneously. What is the probability that
- 5 will not come up on either of them ?
  - 5 will come up on at least one ?
  - 5 will come up at both dice ?

#### 4 SECTION D

- 26) Solve the following equation for x :

$$9x^2 - 9(a+b)x + (2a^2 + 5ab + 2b^2) = 0$$

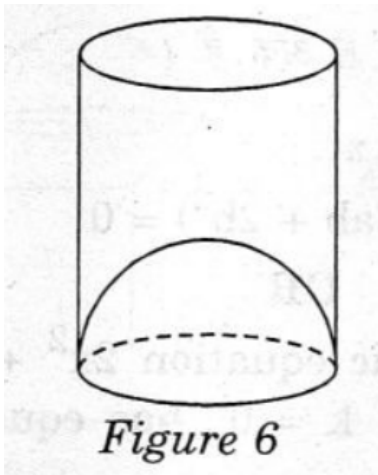
OR

If (-5) is a root of the quadratic equation  $2x^2 + px - 15 = 0$  and the quadratic equation  $p(x^2 + x) + k = 0$  has equal roots, then find the values of p and k.

- 27) Prove that the lengths of the tangents drawn from an external point to a circle are equal. Using the above theorem prove that :  
If quadrilateral ABCD is circumscribing a circle, then  
 $AB + CD = AD + BC$ .
- 28) An aeroplane when flying at a height of 3125 m from the ground passes vertically below another plane at an instant when the angles

of elevation of the two planes from the same point on the ground are  $30^\circ$  and  $60^\circ$  respectively. Find the distance between the two planes at that instant.

- 29) A juice seller serves his customers using a glass as shown in Figure 6. The inner diameter of the cylindrical glass is 5 cm, but the bottom of the glass has a hemispherical portion raised which reduces the capacity of the glass. If the height of the glass is 10 cm, find the apparent capacity of the glass and its actual capacity. (Use  $\pi = 3.14$ )



OR

A cylindrical vessel with internal diameter 10 cm and height 10.5 cm is full of water. A solid cone of base diameter 7 cm and height 6 cm is completely immersed in water. Find the volume of

- water displaced out of the cylindrical vessel.
- water left in the cylindrical vessel.

[Take  $\pi = \frac{22}{7}$ ]

- 30) During the medical check-up of 35 students of a class their weights were recorded as follows :

<u>Weight(in kg)</u>	<u>Number of students</u>
38-40	3
40-42	2
42-44	4
44-46	5
46-48	14
48-50	4
50-52	3