

# C.B.S.E. Mathematics (Basic) SOVLED PAPER 2020

Delhi Set – 1

## SECTION-A

Nos. 1 to 10 are multiple choice questions. Select the correct options.

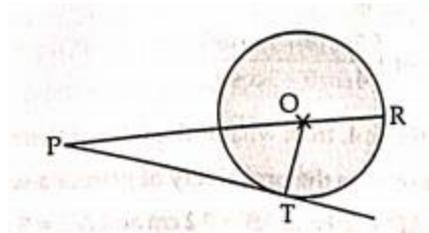
1. HCF of 144 and 198 is

- (a) 9
- (b) 18
- (c) 6
- (d) 12

2. The median and mode respectively of a frequency distribution are 26 and 29. Then its mean is

- (a) 27.5
- (b) 24.5
- (c) 28.4
- (d) 25.8

3. In a circle of radius 7 cm, tangent PT is drawn from a point P such that  $PT = 24$  cm. If O is the centre of the circle, then length of PR is



- (a) 30 cm
- (b) 28 cm
- (c) 32 cm
- (d) 25

4. 225 can be expressed as

- (a)  $5 \times 3^2$
- (b)  $5^2 \times 3$
- (c)  $5^2 \times 3^2$

(d)  $5^3 \times 3$

5. The probability that a number selected at random from the numbers 1,2,3.....15 is a multiple of 4 is

(a)  $\frac{4}{15}$

(b)  $\frac{2}{15}$

(c)  $\frac{1}{15}$

(d)  $\frac{1}{5}$

6. If one zero of a quadratic  $(Kx^2 + 3x + k)$  is 2, then the value of  $k$  is

(a)  $\frac{5}{6}$

(b)  $-\frac{5}{6}$

(c)  $\frac{6}{5}$

(d)  $-\frac{6}{5}$

7.  $\overline{2.35}$  is

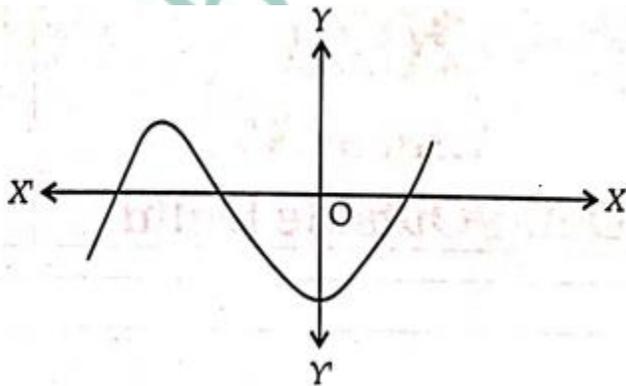
(a) an integer

(b) a rational number

(c) an irrational number

(d) a natural number

8. The graph of a polynomial is shown in then the number of its zeroes is



(a) 3

(b) 1

(c) 2

(d) 4

9. Distance of point P(3,4) from x-axis is

(a) 3 units

(b) 4 units

(c) 5 units

(d) 1 units

10. If the distance between the points A (4, p) and B (1,0) is 5 units, then the value (5) of p is (are)

(a) 4 only

(b) -4 only

(c)  $\pm 4$

(d) 0

11. If the points C (k,4) divides the line segment joining two points A (2,6) and B (5,1) in ration 2 : 3 the value of K is .....

OR

If points A (-3,12) B (7,6) and C (x,9) are collinear, then the value of x is .....

12. If the equations  $kx - 2y = 3$  and  $3x + y = 5$  represent two intersecting lines at unique point, then the value of k is .....

OR

If quadratic equation  $3x^2 - 4x + k = 0$  has equal roots, then the value of k is .....

13. The value of  $(\sin 20^\circ \cos 70^\circ \cos 20^\circ)$  is .....

14. If  $\tan(A + B) = \sqrt{3}$  and  $\tan(A - B) = \frac{1}{\sqrt{3}}$ ,  $A > B$ , then the value of A is .....

15. The perimeters of two similar triangles are 25 cm and 15 cm respectively. If one side of the first triangle is 9 cm, then the corresponding side of second triangle is.....

16. If  $5 \tan \theta = 3$ , then what is the value of  $\left(\frac{5 \sin \theta - 3 \cos \theta}{4 \sin \theta + 3 \cos \theta}\right)$  ?

17. The areas of two circles are in the ration 9: 4, then what is the ration of their circumferences?

18. If a pair of dice is thrown once, then what is the probability of getting a sum of 8?

19. In  $\Delta ABC$ ,  $DE \parallel BC$  such that  $AD = 24$  cm,  $AB = 3.2$  cm and  $AC = 8$  cm, then what is the length of AE?

20. The  $n^{\text{th}}$  term of an A.P. is  $(7-4n)$ , then what is its common difference?

CBSE 10 Maths Sample Paper

CBSE 10 Mathematics Marking Scheme

CBSE Class 10 Syllabus / Exam Pattern

NCERT math Important Formulas

## SECTION – B

Question numbers 21 to 26 carry 2 marks each.

21. A bag contains 5 red balls and some blue balls. If the probability of drawing a blue ball at random from the bag is three times that of red ball, find the number of blue balls the bag.

22. Prove that  $\sqrt{\frac{1-\sin\theta}{1+\sin\theta}} = \sec\theta - \tan\theta$ .

OR

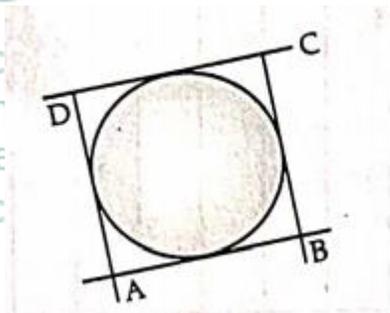
Prove that  $\frac{\tan^2\theta}{1+\tan^2\theta} + \frac{\cot^2\theta}{1+\cot^2\theta} = 1$

23. Two different dice are thrown together, find the probability that the sum of the number appeared is less than 5.

OR

Find the probability that 5 Sundays occur in the month of November of a randomly selected year.

24. In a circle touches all the four sides of a quadrilateral ABCD. If  $AB = 6$  cm,  $BC = 9$  cm,  $CD = 8$  cm, then find the length of AD.



25. The perimeter of a sector of a circle with radius 6.5 cm, is 31 cm, then find the area of the sector.

26. Divide the polynomial  $(4x^2 + 4x + 5)$  by  $(2x + 1)$  and write the quotient and the remainder.

## SECTION – C

Question numbers 27 to 34 carry 3 marks each.

27. If  $\alpha$  and  $\beta$  are the zeroes of the polynomial  $f(x) = x^2 - 4x - 5$  then the value of  $\alpha^2 + \beta^2$ .

28. Draw a circle of radius 4 cm. From a point 7 cm away from the centre of the circle. Construct a pair of tangents to the circle.

OR

Draw a line segment of 6 cm and divide it in the ratio 3 : 2.

29. A solid metallic cuboid of dimension 24 cm  $\times$  11 cm  $\times$  7 cm is melted and recast into solid cones of base radius 3.5 cm and height 6 cm. Find the number of cones so formed.

30. Prove that  $(1 + \tan A = \sec A) \times (1 + \tan A + \sec A) = 2 \tan A$

OR

Prove that  $\frac{\operatorname{cosec} \theta}{\operatorname{cosec} \theta - 1} + \frac{\operatorname{cosec} \theta}{\operatorname{cosec} \theta + 1} = 2 \sec^2 \theta$

31. Give the  $\sqrt{3}$  is an irrational number, show that  $(5 + 2\sqrt{3})$  is an irrational number.

OR

An army contingent of 612 members is to march behind an army band of 48 members in a parade. The two groups are to march in the same number of columns. What is the maximum number of columns in which they can march?

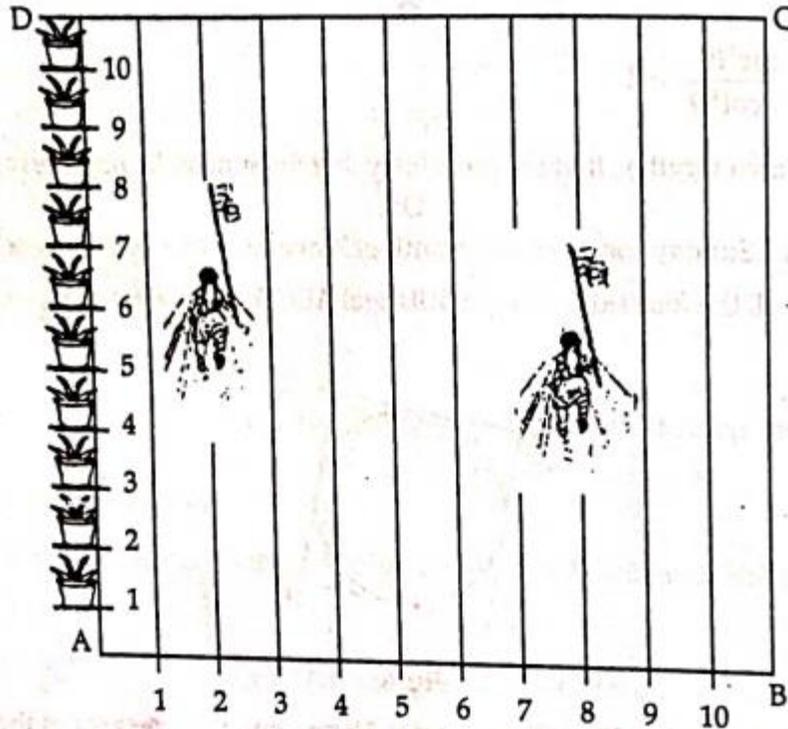
32. Prove that, in a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides.

*Read the following passage carefully and then answer the questions given at the end.*

33. To conduct sports Day activities, in your rectangular shaped school ground ABCD, lines have been drawn with chalk powder at a distance of each. 100 flower pots have been placed at a distance of 1 m from each other along AD, as shown in. Niharika runs  $\frac{1}{4}$ th the distance AD on the 2nd line and posts a green flag. Preet runs  $\frac{1}{5}$ th the distance AD on the 8th line and posts a red flag.

(i) What is the distance between the two flags?

(ii) If Rashmi has to post a blue flag exactly half way between the line segments joining the two flags, where should she post the blue flag?



34. Solve graphically:  $2x + 3y = 2$ ,  $x - 2y = 8$

### SECTION-D

Question number 35 to 40 carry 4 marks each.

35. A two digit number is such that the product of its digits is 14. If 45 is added to the number ; the digits interchange their places. Find the number.

36. If 4 times the 4<sup>th</sup> term of an A.P. is equal to 18 times the 18<sup>th</sup> term, then find the 22<sup>nd</sup> term.

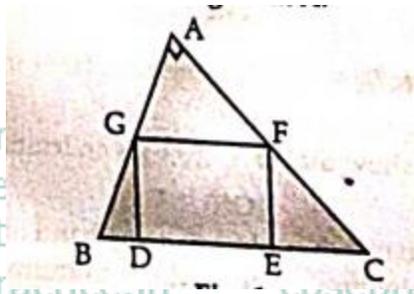
OR

How many terms of the AP : 24, 21, 18 ..... must be taken so that their sum is 78 ?

37. The angle of elevation of the top of a building from the foot of a tower is  $30^\circ$ . The angle of elevation of the top of the tower from the foot of the building is  $60^\circ$ . If the tower 60 m high, find the height of the building.

38. In  $\triangle DEF$  is a square in a triangle  $ABC$  right angled at  $A$ .

Prove that



(i)  $\Delta AGF \sim \Delta DBG$

(ii)  $\Delta AGF \sim \Delta EFC$

In an obtuse  $\Delta ABC$  ( $\angle B$  is obtuse),  $AD$  is perpendicular to  $CB$  produced. Then prove that  $AC^2 = AB^2 + BC^2 + 2BC \times BD$ .

**39.** An open metal bucket is in the shape of a frustrum of cone of height 21 cm with radii of its lower and upper ends are 10 cm and 20 cm respectively. Find the cost of milk which can completely fill the bucket at the rate of ₹40 per liter.

OR

A solid is in the shape of a cone surmounted on a hemisphere. The radius of each of them being 3.5 cm and the total height of the solid is 9.5 cm. find the volume of the solid.

**40.** Find the mean of the following data :

Classes	0.-20	20-40	40-6	60-80	80-100	100-120
Frequency	20	35	52	44	38	31

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