

CBSE Class 9 Maths Question Paper 2021 Set 1

ANNUAL EXAMINATION 2020-21

MATHEMATICS

TIME: 3 Hours
Maximum Marks: 80

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General Instructions:

1. All questions are compulsory.
2. The Question Paper consists of 40 questions divided into four sections A, B C and D.
3. Section A contains 20 questions of 1 mark each, Section B contains 6 questions of 2 marks each, Section C contains 8 questions of 3 marks each and Section D contains 6 questions of 4 marks each.
4. There is no overall choice in the paper. However, internal choice is provided in 3 questions of 1 mark, 1 questions in 2 marks, 2 questions in 3 marks and 3 questions of 4 marks.
5. Use of calculators is not permitted.

Section-A

Qs 1 to 10 are multiple choice questions. Select the most appropriate answer from the given options.

Q 1. The value of $99^2 - 98^2$ is:

- a) 1
- b) 197
- c) 187
- d) 207

Q 2. Every rational number is :

- a) Natural number
- b) An Integer
- c) A real number
- d) A whole number

Q 3. $\sqrt{12} \times \sqrt{15}$ is equal to:

- a) $5\sqrt{6}$
- b) $6\sqrt{5}$
- c) $10\sqrt{5}$
- d) $\sqrt{25}$

Q 4. If two lines intersect each other, then the vertically opposite angles are:

- a. Equal
- b. Unequal
- c. Cannot be determined
- d. None of the above

Q 5. Abscissa of a point is positive in:

- a) I and II quadrants
- b) I and IV quadrants
- c) I quadrant only
- d) II quadrant only

Q 6. If $81y^2 - k = \left(9y + \frac{1}{2}\right)\left(9y - \frac{1}{2}\right)$, then the value of k is:

- a) 0
- b) $\frac{1}{4}$
- c) $\frac{1}{2}$
- d) $\frac{1}{\sqrt{2}}$

Q 7. The complement of $(90^\circ - a^\circ)$ is:

- a) a°
- b) $-a^\circ$
- c) $90^\circ + a$
- d) $90^\circ - a$

OR

If two parallel lines are intersected by a transversal, then each pair of corresponding angles so formed is:

- a) Equal
- b) Complementary
- c) Supplementary
- d) None of these

Q 8. Which of the following angles can be constructed using ruler and compass only?

- (a) 35°
- (b) 40°
- (c) 37.5°
- (d) 47.5°

Q 9. $2\sqrt{3} + \sqrt{3}$ is equal to:

- a) $2\sqrt{6}$
- b) 6
- c) $4\sqrt{6}$
- d) $3\sqrt{3}$

Q 10. The curved surface area of a right circular cylinder of height 14 cm is 88 cm^2 . Find the diameter of the base of the cylinder.

- (a) 1 cm
- (b) 2 cm
- (c) 3 cm
- (d) 4 cm

(Qs 11 to Qs 15) Fill in the blanks:

Q 11. If the lengths of two sides of an isosceles triangle are 4 cm and 10 cm, then the length of the third side is cm.

OR

If the height of a triangle is halved then its area will become of the original area.

Q 12. is found by adding all the values of the observations and dividing this by the total number of observations.

Q 13. The sum of the areas of the plane and curved surfaces (faces) of a solid is called its surface area.

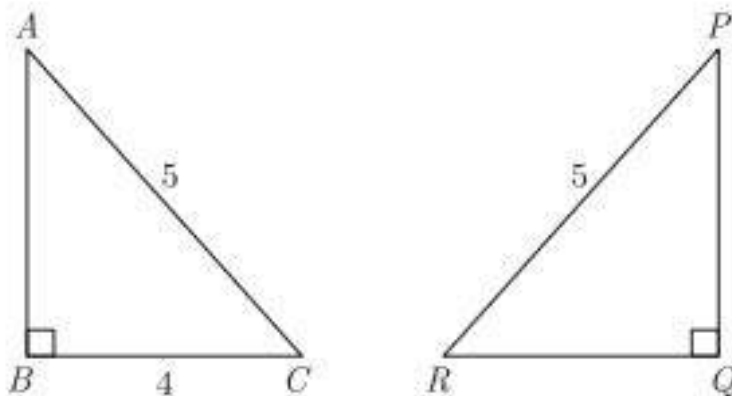
Q 14. If n is an odd number, the median = value of the observation.

Q 15. can also be drawn independently without drawing a histogram.

(Q16 to Qs 20) Answer the following:

Q16. Find 2 irrational numbers between 1 and 2.

Q17. If $\triangle ABC$ is congruent to $\triangle PQR$, find the length of QR.



Q 18. Two coins are tossed simultaneously. List all possible outcomes.

Q 19. In which quadrant (6, -4) will lie?

OR

Find the zero of a polynomial $2x + 4$.

Q 20. Is it correct to say that in a histogram, the area of each rectangle is proportional to the class size of the corresponding class interval? If not, correct the statement.

Section-B

Q 21. Using suitable identity evaluate the following:

(i) 98^3

(ii) 188×212

Q 22. Two circles are drawn with sides AB and AC of a triangle ABC as Diameters. The circles intersect at a point D. If AB = 5cm, BD = 3 cm and AC = 6 cm, find BC.

Q 23. The angles of a triangle are in the ratio 2:3:4. Find all the angles of the triangle.

Q 24. Find the value of k if $(x-1)$ is a factor of $4x^3+3x^2-4x+k$.

Q 25. The ratio between the radius of the base and height of a cylinder is 2:3. If its volume is 1617 cm^3 , find the total surface area of the cylinder.

OR

The dimensions of a cuboid are in the ratio of 1 : 2 : 3 and its total surface area is 88 m^2 . Find the dimensions.

Q 26. If $\frac{(\sqrt{2}-1)}{(\sqrt{2}+1)} = x + y\sqrt{2}$, then find the values of x and y.

Section-C

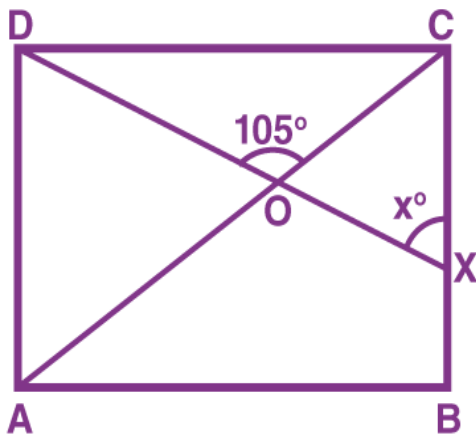
Q 27. Calculate the perimeter of a rectangle whose area is $25x^2 - 35x + 12$.

Q 28. The perimeter of a triangle is 50 cm. One side of a triangle is 4 cm longer than the smaller side and the third side is 6 cm less than twice the smaller side. Find the area of the triangle.

OR

Sides of a triangle are in the ratio of 12 : 17 : 25 and its perimeter is 540 cm. Find its area.

Q 29. In the adjacent figure, ABCD is a square. A line segment DX cuts the side BC at X and the diagonal AC at O, such that $\angle COD = 105^\circ$. Find the value of x.



Q 30. What must be subtracted from $4x^4 - 2x^3 - 6x^2 + x - 5$, so that the result is exactly divisible by $2x^2 + x - 1$?

OR

If $x + y = 12$ and $xy = 27$, find the value of $x^3 + y^3$?

Q 31. Cards marked with the numbers 2 to 101 are placed in a box and mixed thoroughly. One card is drawn from this box. Find the probability that the number on the card is a number which is a perfect square.

Q 32. ABC is a triangle inscribed in a circle with center O. If $\angle AOC = 130^\circ$ and $\angle BOC = 150^\circ$, find $\angle ACB$.

Q 33. The linear equation that converts Fahrenheit (F) to Celsius (C), is given by the relation $C = (5F - 160)/9$.

(i) If the temperature is 86°F , then what is the temperature in Celsius?

(ii) If the temperature is 35°C , then what is the temperature in Fahrenheit?

(iii) If the temperature is 0°C , then what is the temperature in Fahrenheit and if temperature is 0°F , then what is the temperature in Celsius?

OR

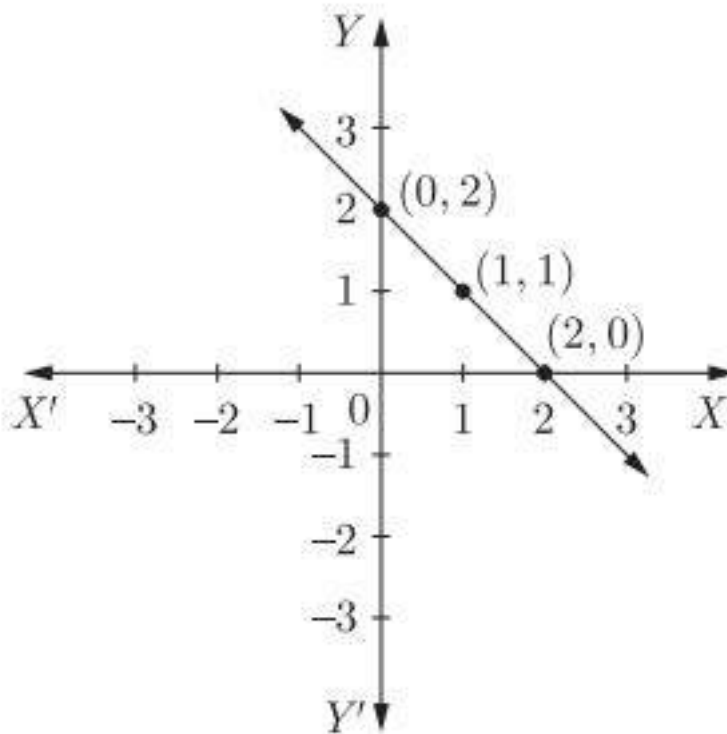
Solve : $4x - 18 = 3y$, $6x + 7y - 4 = 0$

Q 34. From the choices given below, choose the equation whose graph is shown in the figure.

(i) $x + y = 2$

(ii) $x - y = 2$

(iii) $2x + 2y = 6$



Section-D

Q 35. (a) Find the remainder when x^3+3x^2+3x+1 is divided by

- (i) $x+1$
- (ii) $x+2$

(b) Use the Factor Theorem to determine whether $g(x)$ is a factor of $p(x)$ in each case:

- (i) $p(x) = 2x^3+x^2-2x-1$, $g(x) = x+1$
- (ii) If $(x - 2a)$ is a factor of $2x^4 - 4ax^3 + 7x^2 - 13ax - 18$, find the value of a .

Q 36. Simplify using laws of exponents:

a. $(1^3 + 2^3 + 3^3)^{1/2}$

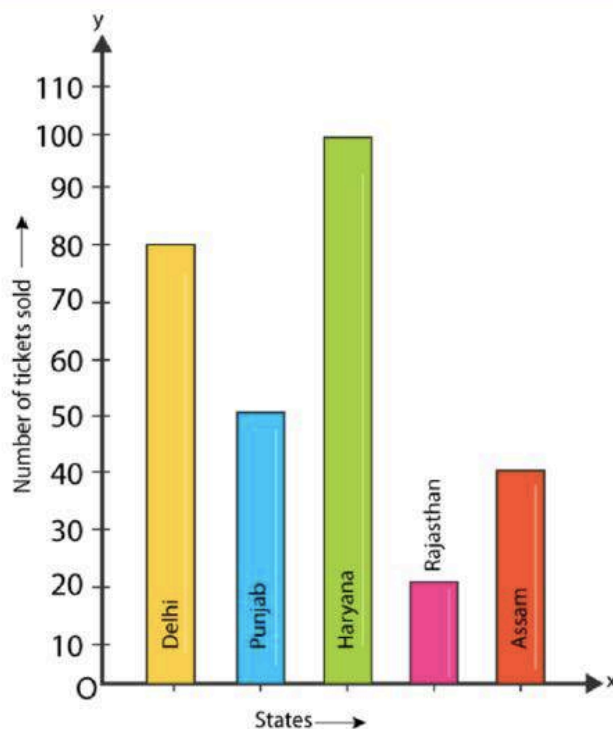
b. $7^{2/3} \times 7^{1/3}$

c. $5^{1/3} \div 5^{1/5}$

d. $(27)^{2/3}$

Q 37. Read the bar graph shown below and answer the following questions:

- a. What is the information given by the bar graph?
- b. How many tickets of Assam State Lottery were sold by the agent?
- c. Of which state, were the maximum number of tickets sold?
- d. State whether true or false.
"The maximum number of tickets sold is three times the minimum number of tickets sold."
- e. Of which state were the minimum numbers of tickets sold?



OR

For a particular year, following is the distribution of ages (in years) of primary school teachers in a district:

Age (in years)	15-20	20-25	25-30	30-35	35-40	40-45	45-50
No. of teachers	10	30	50	50	30	6	4

- Draw the histogram of the above data.
- Maximum teachers are in which age group?
- How many teachers are in age group 45-50?

Q 38. A metallic sheet is of the rectangular shape with dimensions 48 cm x 36 cm. From each one of its corners, a square of 8 cm is cut off. An open box is made of the remaining sheet. Find the volume of the box.

OR

The circumference of the base of a 10 m height conical tent is 44 meters. Find the length of the canvas used in making the tent if width of canvas is 2 m. ($\pi = 22/7$)

Q 39. Draw the graph of equation $5x + 3y = 4$ and check whether

- $x = 2, y = 5$
- $x = -1, y = 3$ are solutions.

OR

In a class, the number of girls is x and that of boys is y . Also, the number of girls is 10 more than the number of boys. Write the given data in the form of a linear equation in two variables. Also, represent it graphically. Find graphically the number of girls, if the number of boys is 20.

Q 40. Water is flowing at the rate of 3 km/hour through a circular pipe of 20 cm internal diameter into a circular cistern of diameter 10 m and depth 2 m. In how much time will the cistern be filled?