QB365

Model Question Paper 1

9th Standard CBSE

Mathematics

Reg.No. : | | | | | | |

Time : 02:00:00 Hrs

Total Marks : 100

Section-A

1) A rational number lying between -3 and 3 is: **1**

(a) 0 (b) -4.3 (c) -3.4 (d) 1.101 1001 10001...

2) Every rational number is: **1**

(a) a natural number (b) an integer (c) a real number (d) a whole number

3) Which one of the following is an irrational number? **1**

(a) 0.14 (b) $0.\overline{1416}$ (c) $0.\overline{1416}$ (d) 0.401 4001 40001 4...

4) Which of the following is a rational number? **1**

(a) $1+\sqrt{3}$ (b) π (c) $2\sqrt{3}$ (d) 0

5) Two rational numbers between $\frac{2}{3}$ and $\frac{5}{3}$ are: **1**

(a) 1/6 and 2/6 (b) 1/2 and 2/7 (c) 5/6 and 7/6 (d) 2/3 and 4/3

6) Which of the following is an irrational number? **1**

(a) 0.15 (b) $0.15\overline{16}$ (c) $0.\overline{1516}$ (d) 0.501 5001 50001...

7) The expansion for $(x-y)^2$ is **1**

(a) $x^2-2xy+y^2$ (b) $x^2+2xy+y^2$ (c) x^2+y^2 (d) x^2-y^2

8) Which of the following is a polynomial in one variable? **1**

(a) $3-x^2+x$ (b) $\sqrt{3x}+4$ (c) x^3+y^3+7 (d) $x+\frac{1}{x}$

9) The degree of the polynomial p(x)=3 is: **1**

(a) 3 (b) 1 (c) 0 (d) 2

10) The value of polynomial $6a^2+7a-3$ when a=1 is: **1**

(a) 10 (b) 4 (c) -13 (d) -4

11) If x is positive and y is negative, then the point (x,y) lies in **1**

(a) III quadrant (b) IV quadrant (c) II quadrant (d) I quadrant

12) Where do the II and IV quadrants meet? **1**

(a) at O (b) in y - axis (c) in x -axis (d) do not intersect

13) The co-ordinates of a point whose ordinate is 6 and which lies on y-axis are: **1**

(a) (0,6) (b) (0,-6) (c) (6,0) (d) (-6,0)

14) In which quadrant does the point (2,3) lie? **1**

(a) I (b) II (c) III (d) IV

15) The equation $x + \sqrt{2} = 0$ has **1**

(a) no solution (b) infinitely many solutions (c) only one solution (d) only two solution

16) North-South direction and East-West direction **1**

(a) are perpendicular to each other (b) are parallel to each other (c) are opposite to each other

(d) None of these

17) The line of intersection of I and II quadrants is **1**

(a) x - axis (b) y - axis (c) vertical axis (d) None of these

18) Write a, b, c for the equation 2x=5 **1**

(a) 2, 0, -5 (b) 0,2,-5 (c) 0,0,-5 (d) 2,0,5

19) The point which lies on y-axis at a distance of 6 units in the negative direction of y-axis is: **1**

(a) (0,6) (b) (6,0) (c) (0,-6) (d) (-6,0)

20) The equation in 3x+4y=12 has **1**

(a) a unique solution (b) no solution (c) two solution (d) infinitely may solution

Section-B

21) Are the following statements true or false? Give reasons for your answers. **2**

(i) Every whole number is a natural number.

(ii) Every integer is a rational number.

(iii) Every rational number is an integer.

22) Write three rational numbers between -2/5 and -1/5. **2**

23) Find five rational numbers between 1 and 2. **2**

24) Find an irrational number between 1/7 and 2/7. **2**

25) Simplify: $\frac{23^{-10}}{23^{7}}$ **2**

26) Simplify: $(7)^{-3}(9)^{-3}$ **2**

27) $7x^2 - 5$ **2**

28) Find the value of each of the following polynomials at the indicated value of variables: **2**

$q(y) = 3y^2 3 - 4y + \sqrt{11} \quad at \quad y = 2$

29) If -1 is a zero of the polynomial $p(x) = ax^3 - x^2 + x + 4$,find the value of a. **2**

30) Find if remainder obtained on dividing polynomial $p(x) = y^3 + ay^2 + 5y - 25$ is a factor of polynomial **2**

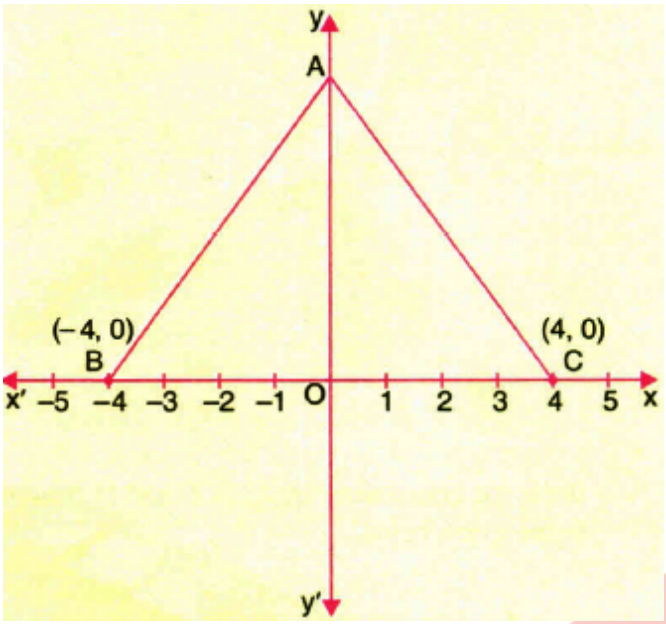
$f(a) = a^2 - 5a + 25$.

31) Factorise: $2x^2 + y^2 + 8z^2 - 2\sqrt{2}xy + 4\sqrt{2}yz - 8xz$ **2**

32) Factorise: $125x^3 + 27y^3 + 8z^3 - 90xyz$ **2**

33) In which quadrant do the given point lie?(4,5) **2**

34) In figure, $\triangle ABC$ is an equilateral triangle with coordinates of B and C as (-4,0) and (4,0) respectively.Find the coordinates of the vertex. **2**



35) Plot the following points A(5,0), B(-1,2), C(2,-2), D(0,4), E(-3,-3), F(0,-1) **2**

36) Plot the points A(2,3), B(2,1), C(0,1) and D(0,3).Join the points and identify the figure obtained.Find its area and perimeter. **2**

37) Write the following as an equation in two variables: **2**

5y=2

38) Find three different solutions for the equation 3x-4y=-12 **2**

39) Solve the equation 3(x + 2) = 2(2x - 1) and represent the solution: **2**

(I) on the number line

(it) in the Cartesian plane.

40) Consider the following statement: There exists a pair of straight lines that are everywhere equidistant from one another. Is this statement a **2**

Section-C

41) You know that $\frac{1}{7} = 0.\overline{142857}$. Can you predict what the decimal expansions of $\frac{2}{7}, \frac{3}{7}, \frac{4}{7}, \frac{5}{7}, \frac{6}{7}$ are, without actually doing the long division?If so how? **5**

42) Evaluate: $\left(\sqrt{2}+\sqrt{3}\right)^2-\left(\sqrt{5}+\sqrt{2}\right)^2$ **5**

43) If both (x-2) and $\left(x-\frac{1}{2}\right)$ are factors of px^2+5x+r show that p=r. **5**

44) The perpendicular distance of a point from the x-axis is 2 units and the perpendicular distance from the y-axis is 3 units.Write the coordinates of the point if it lies in the: **5**

(i) I quadrant

(ii) II quadrant

(iii) III quadrant

(iv) IV quadrant

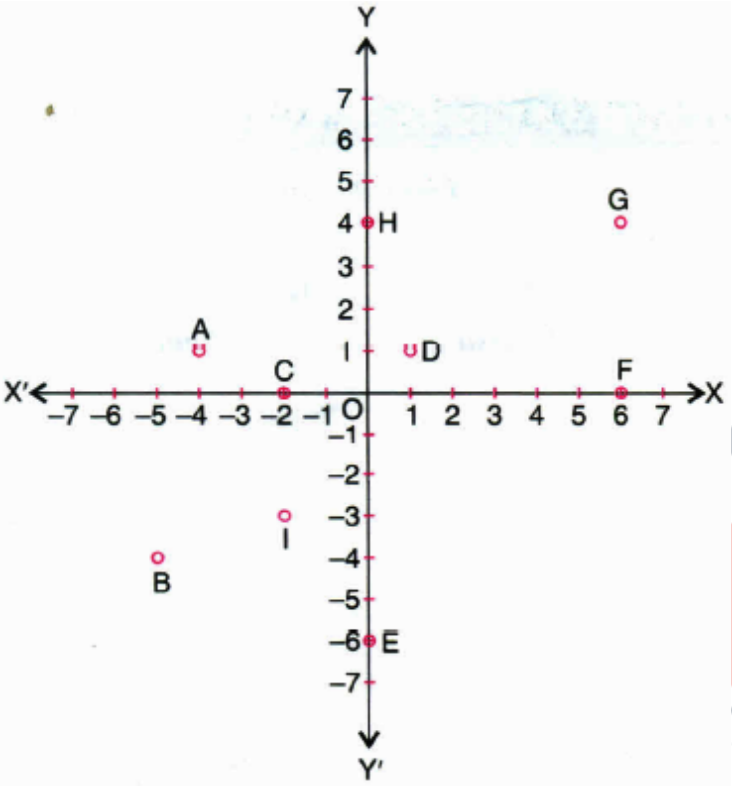
45) From the given figure, write **5**

(i) The coordinates of the points B and F

(ii) The abscissae of points A and C

(iii) The ordinates of the points A and C.

(iv) The perpendicular distance of the point G from the x-axis.



46) Express the following statement as a linear equation in two variables by taking present ages (in years) of father and son as x and y, respectively.Age of father 5 years ago was two years ago was teo years more than 7 times the age of his son at that time. **5**

47) Determine the point on the graph of the equation 2x+5y=20 where x-coordinate is $\frac{5}{2}$ times its ordinate. **5**

48) (i) If a point C lies between two points A and B such that AC = BC, then prove that AC= AB. **5**

(ii) Is CB = $\frac{1}{2}$ AB?

(iii) Apala says that the ratio of AC and BC is 1 : 1. Is she correct? If so, which value of Apala is depicted by her statement?

(iv) Which mathematical concept has been covered in this problem?

(v) Write the formulae used in the solution

****

Section-A

1) (a) 0 **1**

2) (c) a real number **1**

3) (d) 0.401 4001 40001 4... **1**

4) (d) 0 **1**

5) (c) 5/6 and 7/6 **1**

6) (d) 0.501 5001 50001... **1**

7) (a) $x^2 - 2xy + y^2$ **1**

8) (a) $3 - x^2 + x$ **1**

9) (c) 0 **1**

10) (a) 10 **1**

11) (b) IV quadrant **1**

12) (a) at O **1**

13) (a) (0,6) **1**

14) (a) I **1**

15) (c) only one solution **1**

16) (a) are perpendicular to each other **1**

17) (a) x - axis **1**

18) (a) 2, 0, -5 **1**

19) (c) (0,-6) **1**

20) (d) infinitely may solution **1**

Section-B

21) (i) False, because zero is a whole number but not a natural number. **2**
(ii) True, because every integer m can be expressed in the form m/1, and so it is a rational number.
(iii) False because 3/5 is a rational number but not an integer.

22) -7/20,-3/10,-1/4 **2**

23) 7/6,4/3,3/2,5/3 and 11/6 **2**

24) **2**

To find irrational number, firstly we will divide 1 by 7 and 1 by 3.

Now

$\therefore \quad \frac{1}{7} = 0.142857.. = \overline{0.142857}$

Thus, 1/3=0.333..=$0.\overline{3}$

That means the required irrational numbers will lie between $\overline{0.142857}$ and $0.\overline{3}$ Also, the irrational numbers have

non-terminating non-repeating decimals. Hence, the required irrational number between 1/7 and 1/3 is 0.2101001000....

25) 23^{-17} **2**

26) 63^{-3} **2**

27) binomial **2**

28) **2**

29) 2 **2**

30) Yes **2**

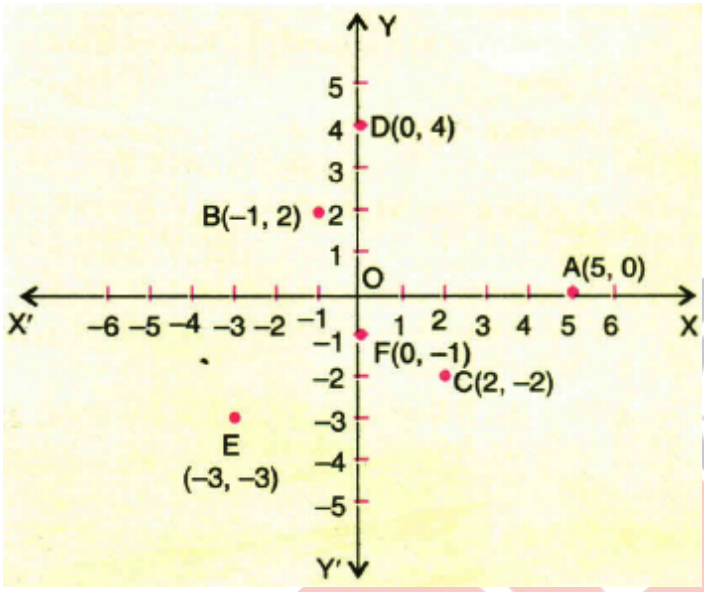
31) $(-\sqrt{2}x + y + 2\sqrt{2}z)^2$ **2**

32) $(5x + 3y + 2z)(25x^2 + 9y^2 + 4z^2 - 15xy - 6yz - 10zx)$ **2**

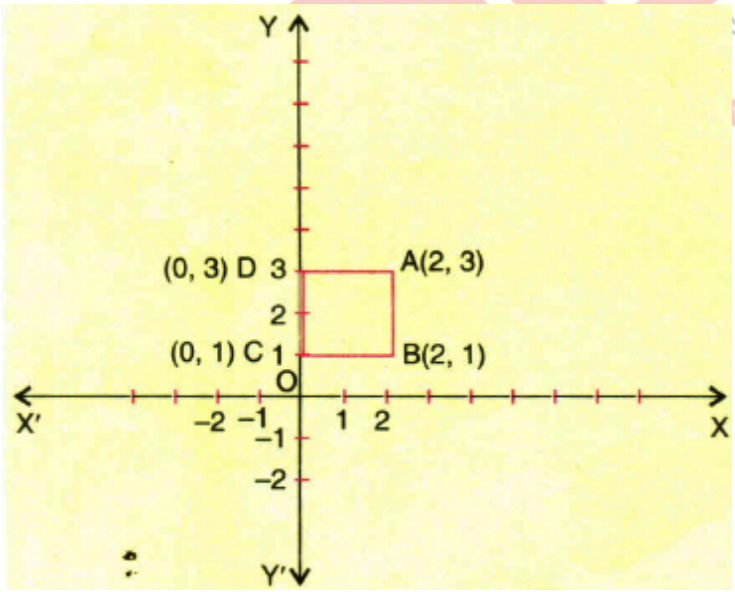
33) I **2**

34) $\left(0, 4\sqrt{3}\right)$ **2**

35) **2**



36) **2**



Square; 4 Square units; 8 units

37) 0x+5y-2=0 **2**

38) (0,3), (4, 6), (-4, 0) **2**

39) x=8 **2**

40) Yes **2**

Section-C

41) **5**

Yes! We can predict the decimal expansions of $\frac{2}{7}, \frac{3}{7}, \frac{4}{7}, \frac{5}{7}, \frac{6}{7}$ without actually doing the long division as follows:

To predict the decimal expansion of 2/7, locate when the remainder becomes 2 and respective quotient.Then write the new quotient beginning from there using the repeating digits 1,4,2,8,5,7.

$\frac{1}{7} = 0.\overline{142857}$

Similarly,

$\frac{2}{7} = 0.\overline{285714}$

$\frac{3}{7} = 0.\overline{428571}$

$\frac{4}{7} = 0.\overline{571428}$

$\frac{5}{7} = 0.\overline{714285}$

$\frac{6}{7} = 0.\overline{857142}$

42) $2(\sqrt{10} + \sqrt{6} - 1)$ **5**

43) Let $f(x) = px^2 + 5x + r$ **5**

If (x-2) is a factor of f(x), then by factor theorem

$f(2) = 0 \quad |x - 2 = 0$

$\Rightarrow \quad x = 2$

$\Rightarrow \quad p(2)^2 + 5(2) + r = 0$

$\Rightarrow \quad 4p + r + 10 = 0 \quad \ldots\ldots\ldots (1)$

If $\left(x - \frac{1}{2}\right)$ is a factor of f(x), then by factor theorem,

$f\left(\frac{1}{2}\right) = 0$

$|x - \frac{1}{2} = 0 \quad \Rightarrow x = \frac{1}{2}$

$\Rightarrow \quad p\left(\frac{1}{2}\right)^2 + 5\left(\frac{1}{2}\right) + r = 0$

$\Rightarrow \quad \frac{p}{4} + \frac{5}{2} + r = 0$

$\Rightarrow \quad p + 4r + 10 = 0 \quad \ldots\ldots (2)$

Subtracting (2) from (1), we get

$3p - 3r = 0$

$\Rightarrow \quad p = r$

44) (i) (3,2) **5**

(ii) (-3,2)

(iii) (-3,-2)

(iv)(3,-2)

45) (i) The coordinates of the points B and F are (-5,-4) and (6,0) respectively. **5**

(ii) The abscissae of points D and H are 1 and 0 respectively.

(iv) The ordinates of the points A and C are 1 and 0 respectively.

(iv) The perpendicular distance of the point G from the x-axis is 4 units.

46) Let the present ages of father and son be x years and y year respectively. **5**

Then, Age of father 5 years ago =(x-5)years

Age of his son 5 years ago(y-5) years

According to the question,

x-5=7(y-5)+2

x-y=7y-35+2

x-7y+28=0

which is the required linear equation in two variables.

47) 2x+5y=20 **5**

$x = \frac{5}{2}y$

$\therefore \ 2\left(\frac{5}{2}, y\right) + 5y = 20$

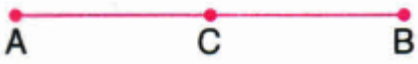
⇒ 10y=20

⇒ y=2

$\therefore \ x = \frac{5}{2}(2) = 5$

Hence the required point is (5, 2).

48) AC=BC I Given **5**



⇒ AC+AC= BC+AC | If equals are added to equals, the wholes are equal.

⇒ 2AC= AB

AC= $\frac{1}{2}$ AB

(ii) AC = OC I Given

AC= $\frac{1}{2}$AB I Proved in (i) above

$\therefore$ CB= $\frac{1}{2}$ AB

(iii) AC=BC I Given

$\therefore$ AC: BC = 1 : 1

$\therefore$ Apala is correct. So, the value 'Sharpness' is depicted by her statement.

(iv) The mathematical concept 'Introduction to Euclid's Geometry' has been covered in this problem.

(v) The formulae used in the solution are as follows:

1. If equals are added to equals, the wholes are equal.

2. Concept of ratio.