

**CLASS IX (2019-20)**  
**MATHEMATICS (041)**  
**SAMPLE PAPER-09**

Time : 3 Hours

Maximum Marks : 80

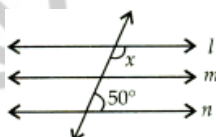
**General Instructions :**

- (i) All questions are compulsory.
- (ii) The questions paper consists of 40 questions divided into four sections A, B, C and D.
- (iii) Section A comprises of 20 questions of 1 mark each. Section B comprises of 6 questions of 2 marks each. Section C comprises of 8 questions of 3 marks each. Section D comprises of 6 questions of 4 marks each.
- (iv) There is no overall choice. However, an internal choices have been provided in two questions of 1 mark each, two questions of 2 marks each, three questions of 3 marks each, and three questions of 4 marks each. You have to attempt only one of the alternatives in all such questions.
- (v) Use of calculators is not permitted.

**SECTION A**

**Q.1-Q.10 are multiple choice questions. Select the most appropriate answer from the given options.**

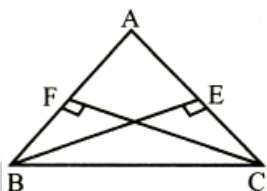
- Q1. Four rational numbers between 3 and 4 are: [1]
- (a)  $\frac{3}{5}, \frac{4}{5}, 1, \frac{6}{5}$  (b)  $\frac{13}{5}, \frac{14}{5}, \frac{16}{5}, \frac{17}{5}$   
 (c) 3.1, 3.2, 4.1, 4.2 (d) 3.1, 3.2, 3.8, 3.9
- Q2. In the method of factorisation of an algebraic expression, which of the following statement is false? [1]
- (a) Taking out a common factor from two or more terms.  
 (b) Taking out a common factor from a group of terms.  
 (c) Using remainder theorem.  
 (d) Using standard identities.
- Q3. If the coordinates of the point  $P$  are  $(3, -5)$  then the perpendicular distance of  $P$  from the  $y$ -axis. [1]
- (a) 4 (b) 5  
 (c) 3 (d) 2
- Q4. The graph of  $y = 6$  is a line [1]
- (a) parallel to  $x$ -axis at a distance 6 units from the origin  
 (b) parallel to  $y$ -axis at a distance 6 units from the origin  
 (c) making an intercept 6 on the  $x$ -axis  
 (d) making an intercept 6 on both the axes
- Q5. For every line  $l$  and for every point  $P$  (not on  $l$ ), there does not exist a unique line through  $P$  [1]
- (a) Which is not parallel to  $l$ .  
 (b) Which is perpendicular to  $l$ .  
 (c) Which is coincident with  $l$ .  
 (d) None of these
- Q6. In figure, if  $l \parallel m$ ,  $m \parallel n$ , then  $x =$  [1]



- (a)  $130^\circ$  (b)  $140^\circ$   
 (c)  $120^\circ$  (d)  $154^\circ$

Q7. In the given figure if  $BE = CF$ , then

[1]



- (a)  $\triangle ABE \cong \triangle ACF$
- (b)  $\triangle ABE \cong \triangle AFC$
- (c)  $\triangle ABE \cong \triangle CAF$
- (d)  $\triangle AEB \cong \triangle AFC$

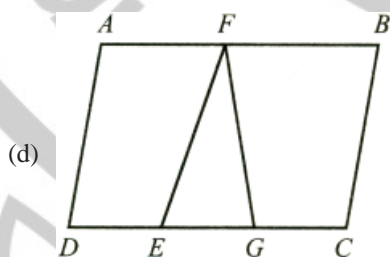
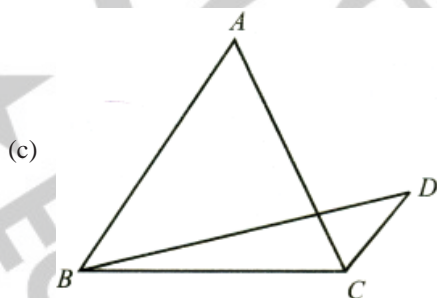
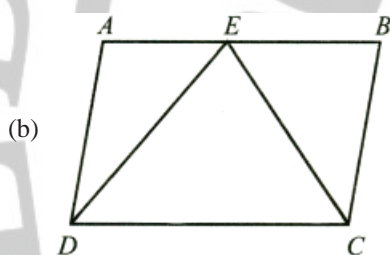
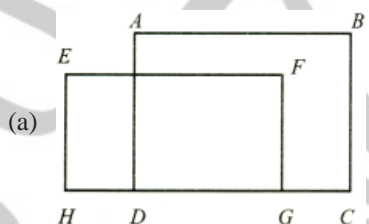
Q8. The angles of a quadrilateral are in the ratio 1 : 2 : 3 : 4. The largest angle is

[1]

- (a)  $36^\circ$
- (b)  $72^\circ$
- (c)  $108^\circ$
- (d)  $144^\circ$

Q9. Which of the following figures lie on the same base and between the same parallels?

[1]



Q10. Diagonals of a cyclic quadrilateral are the diameters of that circle, then quadrilateral is a

[1]

- (a) parallelogram
- (b) square
- (c) rectangle
- (d) trapezium

**(Q.11-Q.15) Fill in the blanks :**

Q11. The construction of a triangle  $ABC$ , given that  $BC = 6$  cm,  $\angle B = 45^\circ$  is not possible when difference of  $AB$  and  $AC$  is equal to ..... cm

[1]

Q12. If the perimeter of an equilateral triangle is 90 m, then its area is ..... m<sup>2</sup>. [1]

OR

If base of a triangle is doubled then its area will be ..... times of original area.

Q13. Volume of a cylinder is three times the volume of a ..... on the same base and of the same height. [1]

Q14. Width of the class-interval is called ..... of class interval. [1]

Q15. Probability is a measure of ..... [1]

(Q.16-Q.20) Answer the following :

Q16. Find a rational number between -5 and -6. [1]

Q17. Find the zero of a polynomial  $2x + 4$  [1]

Q18. Find the image of point (-4, 6) under origin. [1]

Q19. One side of an equilateral triangle is 4 cm Find its area. [1]

Q20. 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. [1]

**SECTION B**

Q21. Find the value of  $x$ ,  $2^{7x} \div 2^{2x} = 5\sqrt{2^{15}}$ . [2]

OR

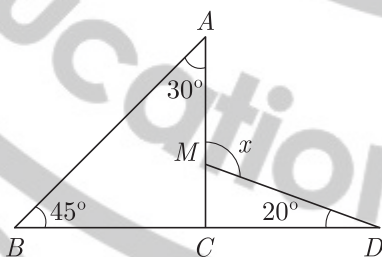
If  $x = \frac{\sqrt{3} + \sqrt{2}}{\sqrt{3} - \sqrt{2}}$ , then find the value of  $x^2$ .

Q22. Write linear equation such that each point on its graph has ordinate 3 times its abscissa. [2]

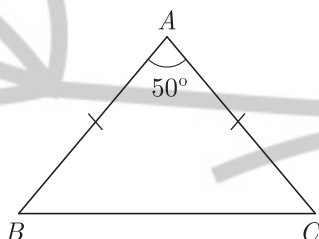
Q23. In which quadrant does the given point lie ? [2]

- (i) A(4, -3)
- (ii) B(-2, 5)
- (iii) C(-3, -2)
- (iv) D(2, 4)

Q24. In the given figure, find the value of  $x$ . [2]

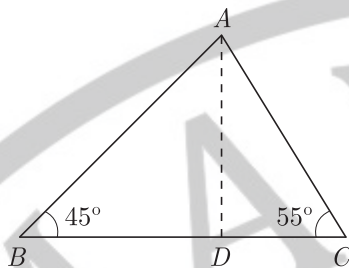


Q25. In a  $\Delta ABC$  if  $AB = 3$  cm,  $AC = 3$  cm and  $\angle A = 50^\circ$ , then find  $\angle B$ . [2]



**OR**

In a triangle  $ABC$ ,  $\angle B = 45^\circ$ ,  $\angle C = 55^\circ$  and bisector of  $\angle A$  meets  $BC$  at a point  $D$ . Find  $\angle ADB$  and  $\angle ADC$ .



Q26. A cuboidal water tank is 8 m long, 6 m wide and 3 m deep. How many litres of water can it hold ? [2]

**OR**

The circumference of the base of a cylindrical vessel is 132 cm and its height is 25 cm. How many litres of water can it hold ? ( $1000 \text{ cm}^3 = 1 \text{ l}$ )

**SECTION C**

Q27. If  $x - y = 5$  and  $xy = 84$ , find the value of  $x^3 - y^3$ . [3]

**OR**

If  $2x + 3y = 12$  and  $xy = 6$ , find the value of  $8x^3 + 27y^3$ .

Q28. If a line is drawn parallel to base of isosceles triangle to intersect its equal sides, then prove that quadrilateral so formed is cyclic. [3]

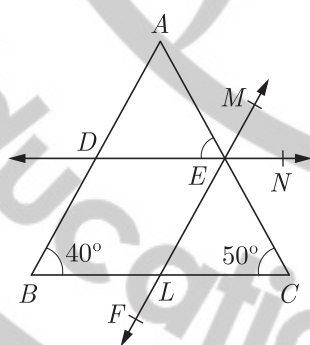
Q29. The perimeter of an isosceles triangle is 32 cm and its base is 12 cm. One of its equal sides forms the diagonal of a parallelogram. Find the area of a parallelogram. [3]

**OR**

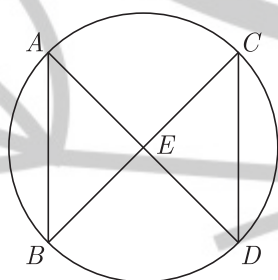
$D$  and  $E$  are the mid-points of  $BC$  and  $AD$  respectively of  $\triangle ABC$ . If area of  $\triangle ABC = 20 \text{ cm}^2$ , find area of  $\triangle EBD$ .

Q30. In the given figure,  $DE \parallel BC$  and  $MF \parallel AB$ . Find : [3]

- (i)  $\angle ADE + \angle MEN$
- (ii)  $\angle BDE$
- (iii)  $\angle BLE$



Q31. In figure,  $AB = CD$ . Prove that  $BE = DE$  and  $AE = CE$ , where  $E$  is the point of intersection of  $AD$  and  $BC$ . [3]



Q32. Construct a triangle  $ABC$  in which  $BC = 7$  cm,  $\angle B = 75^\circ$  and  $AB + AC = 13$  cm. [3]

Q33. The volume of a cylinder is  $448\pi$  cm<sup>3</sup> and height is 7 cm. Find its lateral surface area and total surface area. [3]

**OR**

The largest sphere is carved out of a cube of side 7 cm. Find the volume of the sphere.

Q34. Probability of getting a blue ball is  $\frac{2}{3}$ , from a bag containing 6 blue and 3 red balls. 12 red balls are being added in the bag, then find the probability of getting a blue ball. [3]

### SECTION D

Q35. If  $\frac{\sqrt{7}-1}{\sqrt{7}+1} - \frac{\sqrt{7}+1}{\sqrt{7}-1} = a + b\sqrt{7}$ , find the values of  $a$  and  $b$ . [4]

Q36. Factorise : [4]

$$(a+b)^3 - (b+c)^3 + (c+a)^3 + 3(a+b)(b+c)(c+a)$$

**OR**

If  $a + b + c = 0$ , then prove that  $\frac{(b+c)^2}{3bc} + \frac{(c+a)^2}{3ac} + \frac{(a+b)^2}{3ab} = 1$

Q37. The cost of a shirt of a particular brand is ₹ 1000. Write a linear equation, when the cost of  $x$  shirts is ₹  $y$ . Draw the graph of this equation and find the cost of 12 such shirts from the graph. [4]

Q38. Construct a triangle  $ABC$  in which  $BC = 5.8$  cm,  $\angle B = 45^\circ$  and  $\angle C = 60^\circ$ . Construct angle bisectors of  $\angle B$  and  $\angle C$  and intersect them at point  $O$ . Measure  $\angle BOC$ . [4]

Q39. The outer diameter of a spherical shell is 10 cm and the inner diameter is 9 cm. Find the volume of the metal contained in the shell. (Use  $\pi = \frac{22}{7}$ ) [4]

Q40. The runs scored by two teams A and B on the first 60 balls in a cricket match are given below : [4]

Number of balls	Team A	Team B
1 - 6	2	5
7 - 12	1	6
13 - 18	8	2
19 - 24	9	10
25 - 30	4	5
31 - 36	5	6
37 - 42	6	3
43 - 48	10	4
49 - 54	6	8
55 - 60	2	10

Represent the data of both the teams on the same graph by frequency polygons.

**OR**

Draw a histogram and frequency polygon on the same graph for the following data.

Class interval	Frequency
150 - 200	5
200 - 250	3
250 - 300	5
300 - 350	6
350 - 400	8
400 - 450	7
450 - 500	1