

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

Time : 3 Hours

Maximum Marks : 80

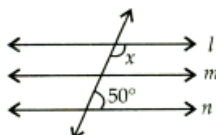
General Instructions :

- (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

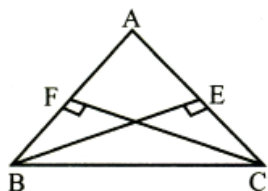
Q.1-Q.10 are multiple choice questions. Select the most appropriate answer from the given options.

- 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° (b) 140°
 (c) 120° (d) 154°

Q7. In the given figure if $BE = CF$, then [1]

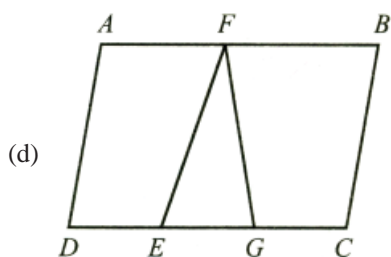
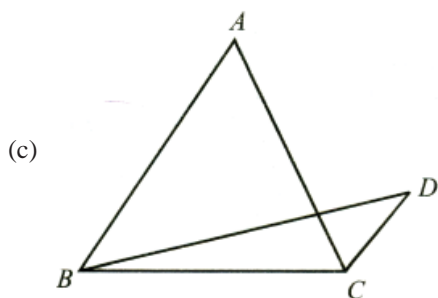
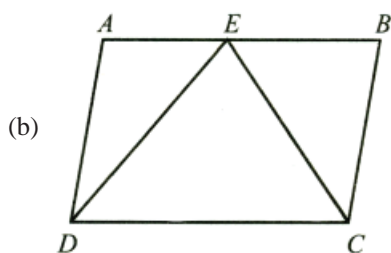
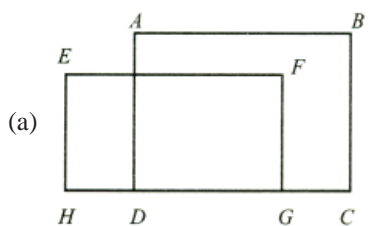


- (a) $\triangle ABE \cong \triangle ACF$
- (b) $\triangle ABE \cong \triangle AFC$
- (c) $\triangle ABE \cong \triangle CAF$
- (d) $\triangle AEB \cong \triangle AFC$

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

- (a) 36°
- (b) 72°
- (c) 108°
- (d) 144°

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 m². [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 , $2^{7x} \div 2^{2x} = \sqrt[5]{2^{15}}$. [2]

OR

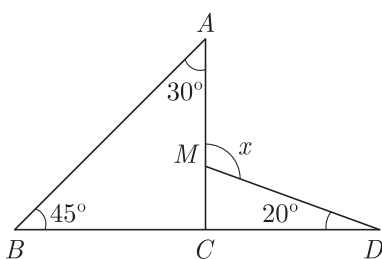
If $x = \frac{\sqrt{3} + \sqrt{2}}{\sqrt{3} - \sqrt{2}}$, then find the value of x^2 .

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

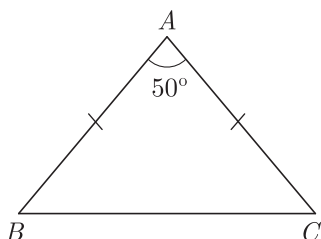
Q23. In which quadrant does the given point lie ? [2]

- (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]

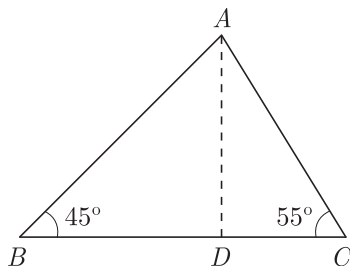


Q25. In a $\triangle ABC$ if $AB = 3$ cm, $AC = 3$ cm and $\angle A = 50^\circ$, then find $\angle B$. [2]



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]

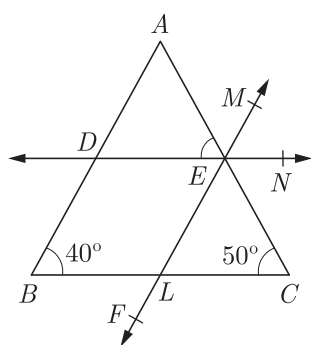
Q29. The perimeter of an isosceles triangle is 32 cm and its base is 12 cm. One of its equal sides forms the diagonal of a parallelogram. Find the area of a parallelogram. [3]

OR

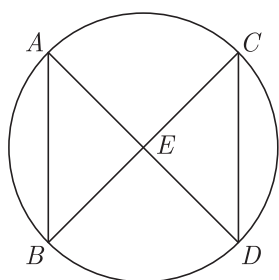
D and E are the mid-points of BC and AD respectively of $\triangle ABC$. If area of $\triangle ABC = 20 \text{ cm}^2$, find area of $\triangle EBD$.

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 448π cm³ 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