

**CLASS IX (2019-20)**  
**MATHEMATICS (041)**  
**SAMPLE PAPER-01**

**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.

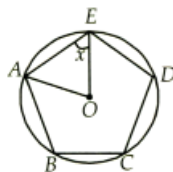
**SECTION A**

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

- Q1.  $0.12\bar{3}$  can be expressed in rational form as [1]  
(a)  $\frac{900}{111}$  (b)  $\frac{111}{900}$   
(c)  $\frac{123}{10}$  (d)  $\frac{121}{900}$
- Q2. Which one of the following algebraic expressions is a polynomial in variable  $x$ ? [1]  
(a)  $x^2 + \frac{2}{x^2}$  (b)  $\sqrt{x} + \frac{1}{\sqrt{x}}$   
(c)  $x^2 + \frac{3x^{3/2}}{\sqrt{x}}$  (d) None of these
- Q3. If  $p(a, b)$  lies in II quadrant then which of the following is true about  $a$  and  $b$ ? [1]  
(a)  $a > 0, b > 0$  (b)  $a > 0, b < 0$   
(c)  $a < 0, b > 0$  (d)  $a < 0, b < 0$
- Q4. If  $P(x, y)$  and  $P'(y, x)$  are same points then which of the following is true? [1]  
(a)  $x + y = 0$  (b)  $xy = 0$   
(c)  $x - y = 0$  (d)  $\frac{x}{y} = 0$
- Q5. According to Euclid's definition, the ends of a line are [1]  
(a) breadth less (b) points  
(c) length less (d) None of these
- Q6. An angle is  $18^\circ$  less than its complementary angle. The measure of this angle is [1]  
(a)  $36^\circ$  (b)  $48^\circ$   
(c)  $83^\circ$  (d)  $81^\circ$
- Q7. Can we draw a triangle  $ABC$  with  $AB = 3$  cm,  $BC = 3.5$  cm and  $CA = 6.5$  cm? [1]  
(a) Yes (b) No  
(c) Can't be determined (d) None of these
- Q8. If in a quadrilateral, two adjacent sides are equal and the opposite sides are unequal, then it is called a [1]  
(a) parallelogram (b) square  
(c) rectangle (d) kite

- Q9. The area of a rhombus is  $20 \text{ cm}^2$ . If one of its diagonals is 5 cm, the other diagonal is [1]  
 (a) 5 cm (b) 6 cm  
 (c) 8 cm (d) 10 cm

- Q10. In the given pentagon  $ABCDE$ ,  $AB = BC = CD = DE = AE$ . The value of  $x$  is [1]



- (a)  $36^\circ$  (b)  $54^\circ$   
 (c)  $72^\circ$  (d)  $108^\circ$

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

- Q11. The construction of a  $\triangle LMN$  in which  $LM = 8 \text{ cm}$ ,  $\angle L = 45^\circ$  is possible when  $(MN + LN)$  is ..... cm. [1]  
 Q12. The sides of a triangle are 25 cm, 17 cm and 12 cm. The length of the altitude on the longest side is equal to ..... cm. [1]

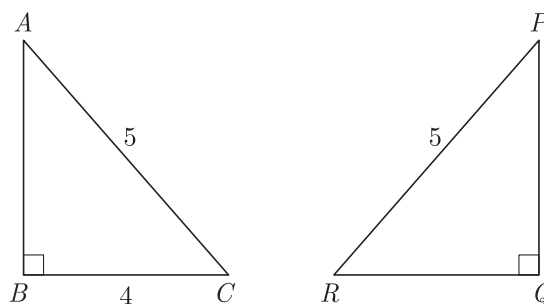
**OR**

Perimeter of an equilateral triangle is always equal to ..... times of length of sides.

- Q13. .... of a solid is the amount of space enclosed by the bounding surface. [1]  
 Q14. .... is the value of the middle most observation (s). [1]  
 Q15. An activity which results in a well defined end is called an ..... . [1]

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

- Q16. What is the degree of zero polynomial? [1]  
 Q17. Write the coordinates of the point which lies at a distance of  $x$  units from  $X$ -axis and  $y$  units from  $Y$ -axis. [1]  
 Q18. If  $\triangle ABC$  is congruent to  $\triangle PQR$ , find the length of  $QR$ . [1]



- Q19. The volume of a sphere is  $38808 \text{ cm}^3$ . Find its radius. [1]  
 Q20. Find the range of the following data; [1]  
 25, 18, 10, 20, 22, 16, 6, 17, 12, 30, 29, 32, 10, 19, 13, 31.

**SECTION B**

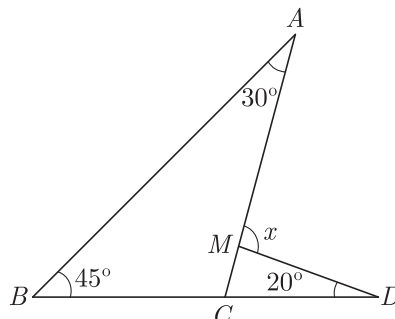
- Q21. Simplify :  $\sqrt{2a^2 + 2\sqrt{6} ab + 3b^2}$  . [2]

**OR**

Simplify :  $\frac{4 + \sqrt{6}}{4 - \sqrt{6}} + \frac{4 - \sqrt{6}}{4 + \sqrt{6}}$

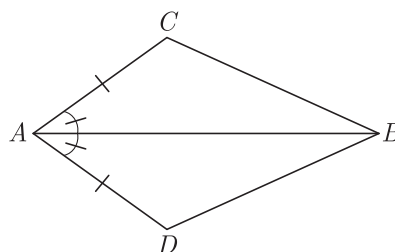
Q22. State Euclid’s fifth postulate. [2]

Q23. In the given figure, find the value of  $x$ . [2]



**OR**

In the given figure, if  $BC = 2.6$  cm, then find  $2BD + \frac{BC}{2}$ .



Q24. Find the remainder when  $3x^3 - 6x^2 + 3x - \frac{7}{9}$  is divided by  $3x - 4$ . [2]

Q25. Find the coordinates of the point : [2]

- (i) Which lies on  $x$  axes both.
- (ii) Whose abscissa is 2 and which lies on the  $x$ -axis.

Q26. The sides of a triangular field are 51 m, 37 m and 20 m. Find the number of flower beds that can be prepared, if each bed is to occupy  $9 \text{ m}^2$  of space. [2]

**OR**

Two cylindrical vessels have their base radii as 16 cm and 8 cm respectively. If their heights are 8 cm and 16 cm respectively, then find the ratio of their volumes.

### SECTION C

Q27. The following table gives the number of pairs of shoes and their corresponding price. [3]

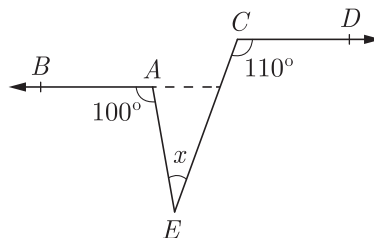
Number of pair of shoes	1	2	3	4	5	6
Corresponding price (₹ in hundred)	5	10	15	20	25	30

Plot these as ordered pairs and join them. What type of graph do you get ?

**OR**

Draw the graph of the linear equation  $x + 2y = 8$  and find the point on the graph where abscissa is twice the value of ordinate.

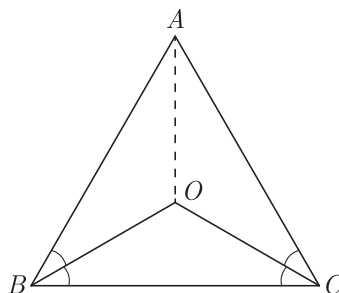
Q28. In the given figure, find  $\angle x$  if  $AB \parallel CD$ . [3]



Q29. In an isosceles triangle  $ABC$ , with  $AB = AC$ , the bisectors of  $\angle B$  and  $\angle C$  intersect each other at  $O$ . Join  $A$  to  $O$ . Show that :

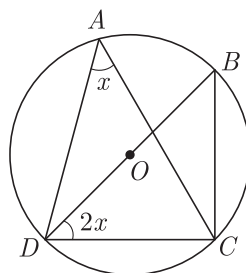
- (i)  $OB = OC$
- (ii)  $AO$  bisects  $\angle A$

[3]



Q30. In the given figure,  $O$  is the centre of the circle. Find the value of  $x$ .

[3]



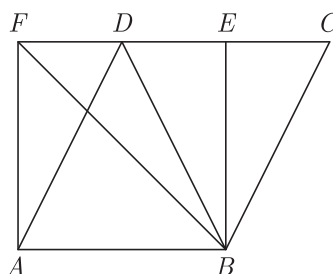
Q31. Construct an angle of  $7\frac{1}{2}^\circ$ , using compass and rules only.

[3]

Q32. The area of the parallelogram  $ABCD$  is  $90\text{ cm}^2$ . Find

- (i)  $ar(||gm\ ABEF)$
- (ii)  $ar(\triangle ABD)$
- (iii)  $ar(\triangle BEF)$

[3]



Q33. Find the ratio of the curved surface areas of two cones, if the diameters of their bases are equal and slant heights are in the ratio 3 : 4.

[3]

**OR**

The sides of a triangle are  $x, x + 1, 2x - 1$  and its area is  $x\sqrt{10}$ . Find the value of  $x$ .

- Q34. A batsman in his 12<sup>th</sup> inning makes a score of 63 runs and thereby increases his average score by 2. What is his average after the 12<sup>th</sup> inning ? [3]

**OR**

A die is rolled 300 times and following outcomes are recorded:

Outcomes	1	2	3	4	5	6
Frequency	42	60	55	53	60	30

Find the probability of getting a number (i) more than 4 (ii) less than 3.

## SECTION D

Q35. Simplify :  $\frac{-3}{\sqrt{3} + \sqrt{2}} - \frac{3\sqrt{2}}{\sqrt{6} + \sqrt{3}} + \frac{4\sqrt{3}}{\sqrt{6} + \sqrt{2}}$  [4]

- Q36. If  $(x^3 + ax^2 + bx + 6)$  has  $(x - 2)$  as a factor and leaves a remainder 3 when divided by  $(x - 3)$ , then find the values of  $a$  and  $b$ . [4]

- Q37. Draw the graph of equation  $5x + 3y = 4$  and check whether

(a)  $x = 2, y = 5$

(b)  $x = -1, y = 3$  are solution. [4]

**OR**

In a class, 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.

- Q38. Prove that the quadrilateral formed by the internal angle bisectors of any quadrilateral is cyclic. [4]

- Q39. Find the mean, median and mode for the following data. [4]

10, 15, 18, 10, 10, 20, 10, 20, 15, 21, 15, 25

- Q40. 50 students of class IX planned to visit an old age home and to spend the whole day with their inmates. Each one prepared a cylindrical flower base using cardboard to gift the inmates. The radius of the cylindrical flower base is 4.2 cm and the height is 11.2 cm. [4]

What is the amount spent for purchasing the cardboard at the rate of ₹ 20 per 100 cm<sup>2</sup> ?

**OR**

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 ?

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