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. $0.12\overline{3}$ 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. What is the formula to calculate the total surface area of a hemispherical solid of radius 'r'. [1]

Q6. An angle is 18° less than its complementary angle. The measure of this angle is [1]

(a) 36° (b) 48°

(c) 83° (d) 81°

Q7. Can we draw a triangle ABC with $AB=3\,\text{cm}$, $BC=3.5\,\text{cm}$ and $CA=6.5\,\text{cm}$? [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

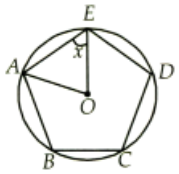
(c) rectangle (d) kite

Q9. The area of a rhombus is 20 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° (b) 54°

(c) 72° (d) 108°

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

Q11. The construction of a $\triangle LMN$ in which $LM = 8$ cm, $\angle L = 45^\circ$ is possible when $(MN + LN)$ is ..... [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]

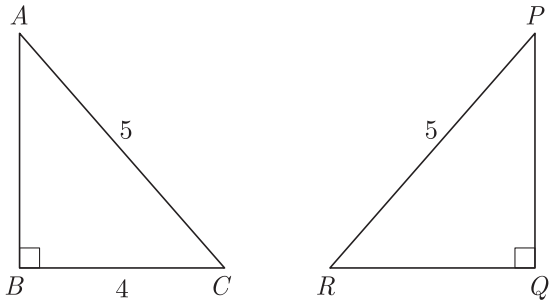
Q15. An activity which results in a well defined end is called an ..... . [1]

(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 ΔABC is congruent to ΔPQR, find the length of QR. [1]



Q19. The volume of a sphere is 38808 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

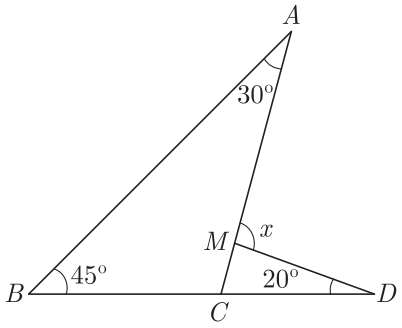
Q21. Simplify : $\sqrt{2a^2 + 2\sqrt{6}\,ab + 3b^2}$. [2]

OR

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

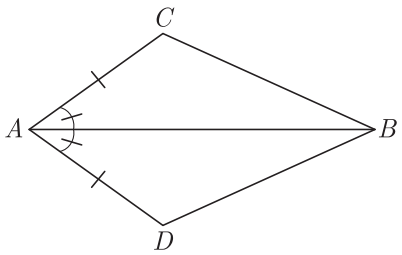
Q22. Evaluate $(998)^3$ using suitable identities. [2]

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



OR

In the given figure, if $BC = 2.6\,\text{cm}$, 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]

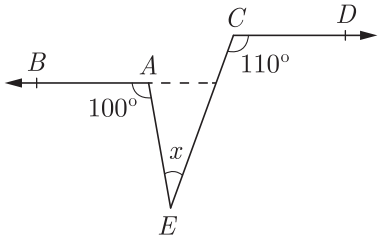
Number of pair of shoes	1	2	3	4	5	6
Corresponding price (₹ in hundred)	5	10	15	20	25	30

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

OR

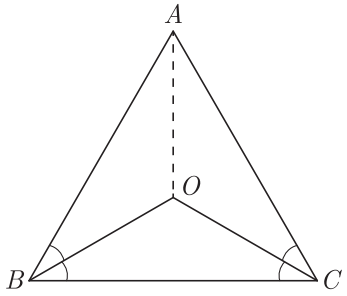
Draw the graph of the linear equation $x + 2y = 8$ and find the point on the graph where abscissa is twice the value of ordinate.

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

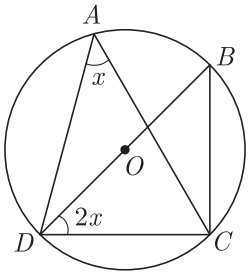


Q29. In an isosceles triangle ABC, with $AB = AC$, the bisectors of $\angle B$ and $\angle C$ intersect each other at O. Join A to O. Show that :

(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]



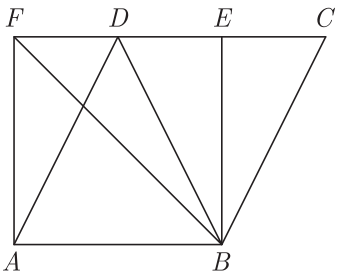
Q31. Construct an angle of $7\frac{1}{2}^{\circ}$, using compass and rules only. [3]

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

(i) $ar(||\ gm\ ABEF)$

(ii) $ar(\Delta ABD)$

(iii) $ar(\Delta BEF)$ [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^{th} inning makes a score of 63 runs and thereby increases his average score by 2. What is his average after the 12^{th} 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 in 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 $100\,cm^2$?

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 ?