

**CLASS IX (2019-20)**  
**MATHEMATICS (041)**  
**SAMPLE PAPER-10**

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.

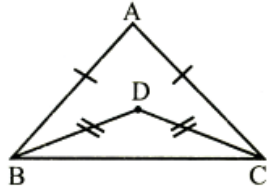
**SECTION A**

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

- Q1. A rational number equivalent to a rational number  $\frac{7}{19}$  is [1]  
 (a)  $\frac{17}{119}$  (b)  $\frac{14}{57}$   
 (c)  $\frac{21}{38}$  (d)  $\frac{21}{57}$
- Q2. If  $x = -2$  and  $x^2 + y^2 + 3xy = -5$ , then find [1]  
 (a)  $-2$  (b)  $3$   
 (c)  $-4$  (d)  $9$
- Q3. A point whose abscissa is  $-3$  and ordinate is  $2$  lies in [1]  
 (a) first quadrant (b) second quadrant  
 (c) third quadrant (d) fourth quadrant
- Q4. If  $(3, -2)$  is a solution of the equation  $3x - py - 7 = 0$ , then the value of  $p$  is [1]  
 (a)  $-1$  (b)  $1$   
 (c)  $-\frac{13}{3}$  (d)  $2$
- Q5. Two distinct lines [1]  
 (a) always intersect.  
 (b) always either intersect or are parallel.  
 (c) always have two common points.  
 (d) are always parallel.
- Q6. Find the value of  $x$ . [1]

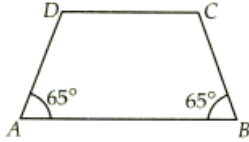


- (a)  $70^\circ$  (b)  $75^\circ$   
 (c)  $60^\circ$  (d)  $65^\circ$
- Q7. In the given figure, the ratio  $\angle ABD : \angle ACD$  is [1]



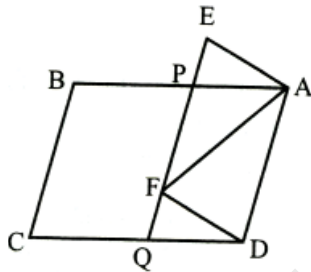
- (a) 1 : 1
- (b) 2 : 1
- (c) 1 : 2
- (d) 2 : 3

Q8. In the given figure  $AB \parallel CD$ , then measure of  $\angle C$  is [1]



- (a)  $65^\circ$
- (b)  $115^\circ$
- (c)  $135^\circ$
- (d)  $125^\circ$

Q9. In figure  $ABCD$  and  $AEFD$  are two parallelograms, then the ratio of  $\text{ar}(\triangle PEA)$  to the  $\text{ar}(\triangle QFD)$ . [1]



- (a) 1 : 4
- (b) 1 : 3
- (c) 1 : 2
- (d) 1 : 1

Q10. The line joining the centre of a circle to the midpoint of a chord is always [1]

- (a) parallel to the chord
- (b) perpendicular to the chord
- (c) equal to the chord
- (d) tangent to the chord

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

Q11. The construction of a triangle  $ABC$ , given that  $BC = 3$  cm,  $\angle C = 60^\circ$  is possible when difference of  $AB$  and  $AC$  is equal to ..... cm. [1]

Q12. The value of semi-perimeter of an equilateral triangle having area  $4\sqrt{3}$  cm<sup>2</sup> is ..... cm. [1]

**OR**

Area of a triangle with perimeter 42 cm and length of two sides 18 cm and 10 cm is given by .....

Q13. The volume of a sphere is ..... to two-thirds the volume of a cylinder of the same height and diameter. [1]

Q14. The range of the data 15, 20, 6, 5, 30, 35, 93, 34, 91, 17, 83, is ..... [1]

Q15. An experiment is called a ..... experiment if all the possible outcomes are pre-decided. [1]

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

Q16. Find the coefficient of  $x^2$  in  $3 + x \cdot x^3 \left( \frac{1}{x} \right)$  [1]

- Q17. In which quadrant  $(6, -4)$  will lie? [1]
- Q18. Euclid divided the 'elements' into how many books? [1]
- Q19. Find the area of right triangle in which the sides containing the right angle measure 20 cm and 15 cm [1]
- Q20. What is the mean of prime numbers between 20 and 30. [1]

**SECTION B**

- Q21. Find the value of  $\frac{6}{\sqrt{5} - \sqrt{3}}$ , if  $\sqrt{3} = 1.732$  and  $\sqrt{5} = 2.236$ . [2]

**OR**

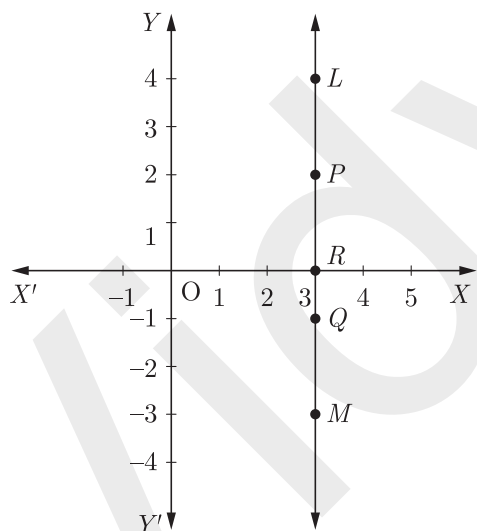
Simplify :  $\frac{8(5\sqrt{2} + 1)}{(\sqrt{2} + 1)^2 - (\sqrt{2} - 1)^2}$  and express as rational denominator.

- Q22. Find the value of  $k$  for the given below equation if  $x = 1$  and  $y = 1$  is its solution.  $9kx + 12ky = 63$  [2]

**OR**

Show that  $x + 3$  is a factor of  $69 + 11x - x^2 + x^3$ .

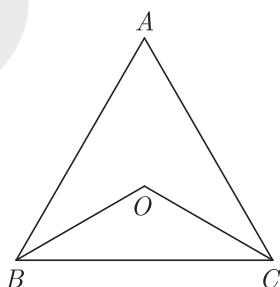
- Q23. In the figure,  $LM$  is a line parallel to the  $y$ -axis at a distance of 3 units.  
 (i) What are the coordinates of  $P$ ,  $R$  and  $Q$  ?  
 (ii) What is the difference between the abscissa of the points  $L$  and  $M$  ? [2]



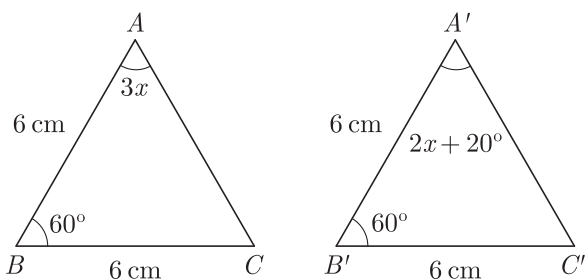
- Q24. Find the supplement of  $\frac{3}{5}$  of a right angle. [2]

**OR**

In the given figure,  $ABC$  is an equilateral triangle. The bisectors of  $\angle ABC$  and  $\angle ACB$  meet at  $O$ . Find the measure of  $\angle BOC$ .



Q25. In the given figure, find the measure of  $\angle B'A'C'$ .



Q26. The diameters of two cones are equal. If their slant heights are in the ratio 5 : 4, then find the ratio of their curved surface areas. [2]

### SECTION C

Q27. The linear equation that converts Fahrenheit (F) to Celsius (C), is given by the relation  $C = \frac{5F - 160}{9}$ . [3]

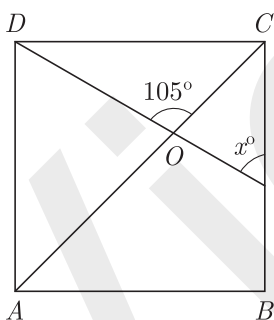
- (i) If the temperature is  $86^\circ\text{F}$ , then what is the temperature in Celsius ?
- (ii) If the temperature is  $35^\circ\text{C}$ , then what is the temperature in Fahrenheit ?
- (iii) If the temperature is  $0^\circ\text{C}$ , then what is the temperature in Fahrenheit and if temperature is  $0^\circ\text{F}$ , then what is the temperature in Celsius ?

OR

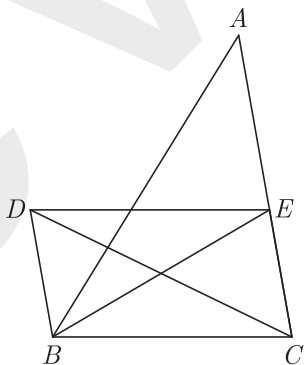
Solve :  $4x - 18 = 3y$ ,  $6x + 7y - 4 = 0$ .

Q28. Prove that, if a transversal intersects two lines, such that pair of alternate interior angles is equal, then the two lines are parallel. [3]

Q29. In the adjacent figure,  $ABCD$  is a square. A line segment  $DX$  cuts the side  $BC$  at  $X$  and the diagonal  $AC$  at  $O$ , such that  $\angle COD = 105^\circ$ . Find the value of  $x$ . [3]



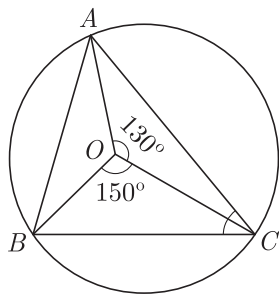
Q30. In the given figure,  $BD \parallel CA$ ,  $E$  is the mid-point of  $CA$  and  $DB = \frac{1}{2} CA$ . Prove that  $ar(\triangle ABC) = 2 ar(\triangle DBC)$ . [3]



OR

The medians  $BE$  and  $CF$  of a  $\triangle ABC$  intersect at  $G$ . Prove that :  $ar(\triangle GBC) = ar(\triangle FGE)$ .

- Q31.  $ABC$  is a triangle inscribed in a circle with centre  $O$ . If  $\angle AOC = 130^\circ$  and  $\angle BOC = 150^\circ$ , find  $\angle ACB$ . [3]



- Q32. Draw any exterior angle of a triangle and bisect it by using compass only. [3]
- Q33. The dimension of a rectangular box are in the ratio 2 : 3 : 4 and the difference between the cost of covering it with sheet of paper at the rate of ₹ 4 and ₹ 4.50 per sq m is ₹ 416. Find the dimensions of the box. [3]

**OR**

A lead pencil consists of a cylinder of wood with a solid cylinder of graphite filled in the interior. The diameter of the pencil is 7 mm and the diameter of the graphite is 1 mm. If the length of the pencil is 14 cm, find the volume of the wood and that of the graphite.

- Q34. Cards marked with the numbers 2 to 101 are placed in a box and mixed thoroughly. One card is drawn from this box. Find the probability that the number on the card is a number which is a perfect square. The quick brown fox jumps voer a little lazy dog. [3]

### SECTION D

- Q35. Express  $0.6 + 0.\bar{7} + 0.4\bar{7}$  in the form of  $\frac{p}{q}$ , where  $p$  and  $q$  are integers and  $q \neq 0$ . [4]

**OR**

Visualise the representation of  $5.3\bar{7}$  using successive magnification upto 4 decimal places, that is up to 5.377.

- Q36. Find the square root of  $(x^2 + 4x + 4)(x^2 + 6x + 9)$ . [4]
- Q37. Draw the graph of linear equations  $y = x$  and  $y = -x$  on the same cartesian plane. Write your observation. [4]
- Q38.  $O$  is the centre of the  $\Delta ABC$  and  $D$  is the mid-point of the base  $BC$ . Prove that  $\angle BOD = \angle A$ . [4]
- Q39. Volume of a right circular cone is  $(\frac{2200}{7})\text{cm}^3$  and its diameter is 10 cm. Find its curved surface area. (Take  $\pi = \frac{22}{7}$ ) [4]

**OR**

Solid sphere of diameter 4 cm are dropped into a cylindrical beaker containing some water and are fully submerged. If the diameter of the beaker is 12 cm and the water rises by 24 cm, find the number of solid spheres dropped in the water.

- Q40. Make a frequency polygon for given frequency table. [4]

Class-Interval	Frequency
0 - 5	2
5 - 10	3
10 - 15	4
15 - 20	1
20 - 25	5
25 - 30	3