

Mansan

FIRST TERM EXAMINATION (2024-25)

CLASS - IX

SUBJECT - MATHEMATICS

Time : 3 Hrs.

Max. Marks : 80

General Instructions:

1. This Question Paper has 5 Sections A, B, C, D and E.
2. Section A has 20 MCQs carrying 1 mark each
3. Section B has 5 questions carrying 02 marks each.
4. Section C has 6 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3 case based integrated units of assessment (04 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory.

Section- A

Q1. $\sqrt{6} \times \sqrt{27}$ is equal to:

- a) $9\sqrt{2}$ b) $3\sqrt{3}$ c) $2\sqrt{2}$ d) $9\sqrt{3}$

Q2. $(x - y)(x + y)(x^2 + y^2)(x^4 + y^4)$ is equal to

- a) $x^{16} - y^{16}$ b) $x^8 - y^8$ c) $x^8 + y^8$ d) $x^{16} + y^{16}$

Q3. The coefficient of x in $(x + 3)^3$ is

- a) 1 b) 9 c) 18 d) 27

Q4. ABC is an isosceles triangle such that $AB=AC$ and AD is median to the base BC. If $\angle ABC = 35^\circ$ then, the measure of $\angle BAD$ is:

- a) 55° b) 70° c) 35° d) 110°

Q5. After rationalizing the denominator of $\frac{3\sqrt{3}}{3\sqrt{2} - 2\sqrt{2}}$ we get the denominator as

- a) 10 b) 2 c) $\sqrt{2}$ d) $3\sqrt{2} + 2\sqrt{2}$

Q6. In triangles ABC and PQR, $AB = AC$, $\angle C = \angle P$ and $\angle B = \angle Q$. The two triangles are:

- (a) Isosceles but not congruent. (b) Isosceles and congruent.
(c) Congruent but not isosceles. (d) Neither congruent nor isosceles.

Q7. Two points having same abscissa, but different ordinates lie on

- a) x- axis b) y-axis
c) a line parallel to y-axis d) a line parallel to x-axis

Q8. If $a + b + c = 0$, then $\frac{a^2}{bc} + \frac{b^2}{ac} + \frac{c^2}{ab}$

- a) 1 b) 0 c) -1 d) 3

Q9. When simplified $\left(\frac{-1}{27}\right)^{\frac{-2}{3}}$, is

- a) 9 b) -9 c) $\frac{1}{9}$ d) $-\frac{1}{9}$

Q10. Euclid stated that all the right angles are equal to each other in the form of

- a) An axiom b) a definition c) a postulate d) a proof

Q11. The angle which exceeds its supplement by 50° is

- a) 115° b) 120° c) 65° d) 80°

For questions 19 and 20, two statements are given - one labeled Assertion (A) and the other labeled Reason (R). Select the correct answer to these questions from the codes a, b, c and d as given below:

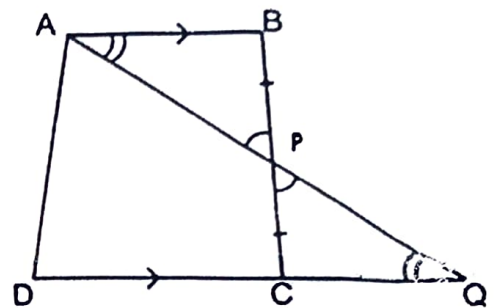
- a) Both A and R are true, and R is the correct explanation of the assertion.
- b) Both A and R are true, but R is not the correct explanation of the assertion.
- c) A is true, but R is false.
- d) A is false, but R is true.

Q19. Assertion: Area of a triangle with sides 3cm, 4cm and 5cm is 6cm^2 .

Reason: Heron's formula for area of a triangle is $\frac{1}{2} \times \text{base} \times \text{height}$.

Q20. Assertion: In the given figure, ABCD is a quadrilateral in which $AB \parallel DC$, P is the mid-point of BC. On producing, AP and DC meet at Q then $DQ = DC + AB$

Reason: If two sides and the included angle of one triangle are equal to two sides and the included angle of the other triangle, then the two triangles are congruent.

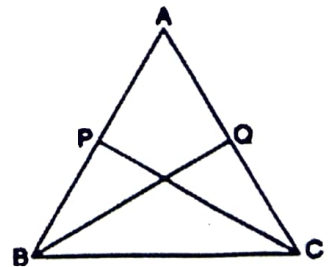


Section B

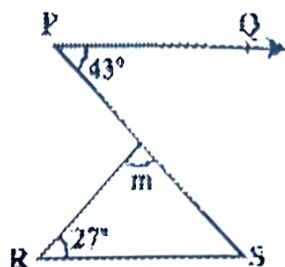
Q21. The perimeter of an isosceles triangle is 32cm. The ratio of the equal side to base is 3:2. Find the area of the triangle.

Q22. If the point A (5, a - 7) lies on the x-axis, then find the value of a. Also find the coordinates of point B (-4a, 7+5a) and in which quadrant it lies?

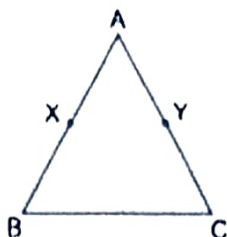
Q23. ABC is an isosceles triangle with $AB = AC$. P and Q are points on AB and AC respectively such that $AP = AQ$. Prove that $CP = BQ$.



Q24. In the given figure, if $PQ \parallel RS$, then find the measure of angle m



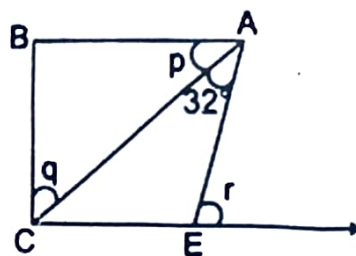
Q25. In given figure $AX = AY$, $AB = AC$. Using Euclid theorem, Show that $BX = CY$.



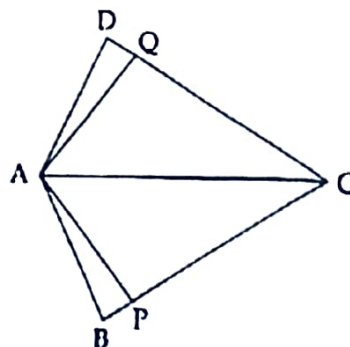
Section C

Q26. Express $15.7 \overline{12}$ in $\frac{p}{q}$ form, where p and q are integers and $q \neq 0$

Q27. In the figure, If $p : q = 11 : 19$, $AB \parallel CE$, $\angle B = 90^\circ$, then find the values of p , q and r .



Q28. The adjoining figure $AB = AD$, $\angle BAP = \angle QAD$ and $\angle PAC = \angle CAQ$, prove that $AP = AQ$.



Q29. If $x = 2 + \sqrt{3}$, then find the value of $x^2 + \frac{1}{x^2}$

Q30. Evaluate using identities:

a) $(0.2)^3 - (0.3)^3 + (0.1)^3$

b) $(98)^3$

Q31. The sides of a triangular field are 41m, 40m and 9m. Find the number of rose beds that can be prepared in the field, if each rose bed, on an average needs 0.09 m² space.

Section D

Q32. Evaluate: $\frac{1}{3 - \sqrt{8}} - \frac{1}{\sqrt{8} - \sqrt{7}} + \frac{1}{\sqrt{7} - \sqrt{6}} - \frac{1}{\sqrt{6} - \sqrt{5}} + \frac{1}{\sqrt{5} - 2}$

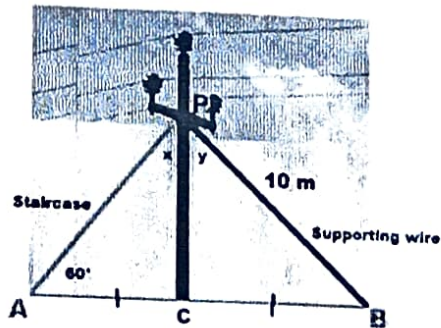
Q33. The polynomial $ax^3 + 3x^2 - 3$ and $2x^3 - 5x + a$ when divided by $(x - 4)$ leaves the same remainder in each case. Find the value of a .

Q34. If two parallel lines are intersected by a transversal, prove that the bisector of two pairs of interior angles form a rectangle.

Q35. Plot the points $P(3,0)$, $Q(7,9)$, $R(-6,9)$ and $S(-2,0)$ on a graph paper. Name the figure PQRS and also find its area.

Section E

Q36. In the village of Surya there was a big electricity pole PC, as shown in the above figure. This pole was tied with a strong wire of 10m length. Once there was a big spark on this pole, thus wires got damaged very badly. Any small fault was usually repaired with the help of a rope which normal board electricians



were carrying on bicycles. This time electricians need a staircase of 10 m so

that it can reach at point P on the pole and this should make 60° with line AC.
Based on the given information, answer the following questions:

- In the figure, is $\triangle PAC$ congruent to $\triangle PBC$? If yes then state the rule. (1)
- What is the value of $\angle PCB$ and $\angle PBC$? (1)
- What is the value of x and y , also what type of triangle is $\triangle PBA$? (2)

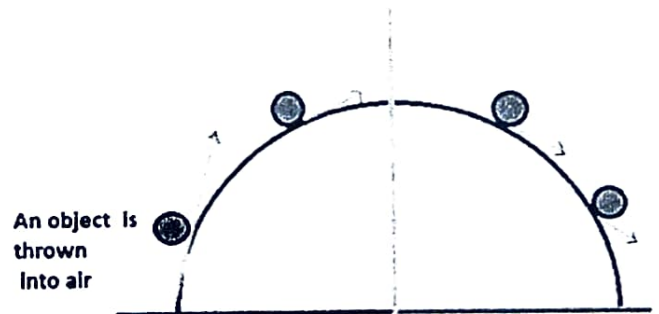
Q37. UFO's are any unexplained moving object observed in the sky, especially one assumed by some observers to be of extraterrestrial (coming from a place outside the plane earth) origin. Rahul a student of class IX has an interest in a Space Science. So, he makes a model



of a triangular shape of UFO which is shown in the figure. The measurement of the sides of UFO is in the ratio 5:5:8 and its perimeter is 180 cm respectively.

- What is the measure of the sides of the triangular UFO? (1)
- What is the area of the UFO? (2)
- Find the total cost to make the UFO, if the rate of the material is $80/\text{cm}^2$. (1)

Q38. An object which is thrown or projected into the air, subject to only the acceleration of gravity is called a projectile and its path is called its trajectory. The curved path a projectile follows was shown by Galileo to be a parabola. Parabola is represented



by a polynomial. If the polynomial to represent the distance covered is given by $p(x) = -6x^2 + 48x + 24$.

- a) What is the degree of the polynomial and its leading coefficient? (1)
- b) Find the value of K if $x - 3$ is a factor of $k^2x^3 - x^2 + 3x - 1$. (1)
- c) Find the height of the projectile 5 seconds after it's launched. (2)