

SUBJECT: MATHEMATICS

CLASS: IX

MAX. MARKS: 40

DURATION: 1½ hrs

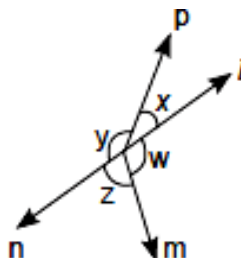
General Instructions:

- (i). All questions are compulsory.
- (ii). This question paper contains 20 questions divided into five Sections A, B, C, D and E.
- (iii). **Section A** comprises of 10 MCQs of 1 mark each. **Section B** comprises of 4 questions of 2 marks each. **Section C** comprises of 3 questions of 3 marks each. **Section D** comprises of 1 question of 5 marks each and **Section E** comprises of 2 Case Study Based Questions of 4 marks each.
- (iv). There is no overall choice.
- (v). Use of Calculators is not permitted

SECTION – A

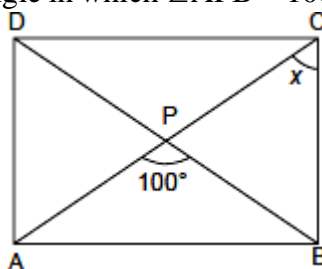
Questions 1 to 10 carry 1 mark each.

1. In the given figure, $\angle x = 20^\circ$, $\angle y = 160^\circ$, $\angle w = 105^\circ$, $\angle z = 75^\circ$.

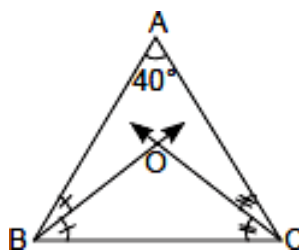


Indicate the correct option.

- (a) ray m and ray n are opposite rays (b) ray l and ray n are opposite rays
 - (c) ray p and ray n are opposite rays (d) none of these
2. Euclid stated that all right angles are equal to each other in the form of
- (a) an axiom (b) a definition (c) a postulate (d) a proof
3. In the given figure, ABCD is a rectangle in which $\angle APB = 100^\circ$. The value of x is

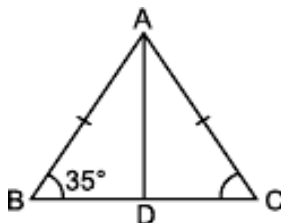


- (a) 40° (b) 50° (c) 60° (d) 70°
4. In the given figure, measure of $\angle BOC$ is



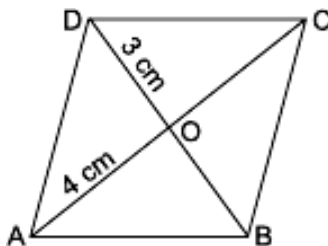
- (a) 110° (b) 40° (c) 70° (d) 60°

5. In the given figure, AD is the median, then $\angle BAD$ is



- (a) 35° (b) 70° (c) 110° (d) 55°
6. Given two right-angled triangles ABC and PRQ, such that $\angle A = 30^\circ$, $\angle Q = 30^\circ$ and $AC = QP$. Write the correspondence if triangles are congruent.
- (a) $\triangle ABC \cong \triangle PQR$ (b) $\triangle ABC \cong \triangle PRQ$
 (c) $\triangle ABC \cong \triangle RQP$ (d) $\triangle ABC \cong \triangle QRP$

7. In the given figure, ABCD is a rhombus, $AO = 4$ cm and $DO = 3$ cm. Then the perimeter of the rhombus is



- (a) 18 cm (b) 20 cm (c) 21 cm (d) 22 cm
8. Which of the following statement is correct?
- (a) a trapezium is a parallelogram (b) every rectangle is a parallelogram
 (c) every parallelogram is a rectangle (d) every rhombus is a square

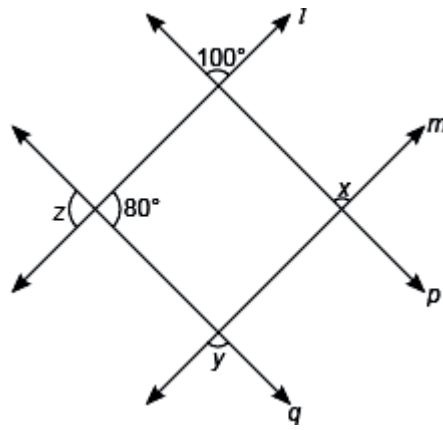
In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

- (a) Both A and R are true and R is the correct explanation of A.
 (b) Both A and R are true but R is not the correct explanation of A.
 (c) A is true but R is false.
 (d) A is false but R is true.
9. **Assertion (A):** The angles of a quadrilateral are x° , $(x - 10)^\circ$, $(x + 30)^\circ$ and $(2x)^\circ$, the smallest angle is equal to 58°
Reason (R): Sum of the angles of a quadrilateral is 360°
10. **Assertion (A):** Two angles measures $a - 60^\circ$ and $123^\circ - 2a$. If each one is opposite to equal sides of an isosceles triangle, then the value of a is 61° .
Reason (R): Sides opposite to equal angles of a triangle are equal.

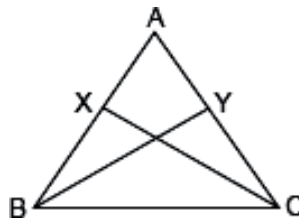
SECTION – B

Questions 11 to 14 carry 2 marks each.

11. Solve the equation, $x - 10 = 25$ and state which Euclid's axiom do you use here.
12. Find the value of x and y in the given figure, if $l \parallel m$ and $p \parallel q$.



13. In the figure below, ABC is a triangle in which $AB = AC$. X and Y are points on AB and AC such that $AX = AY$. Prove that $\triangle ABY \cong \triangle ACX$.

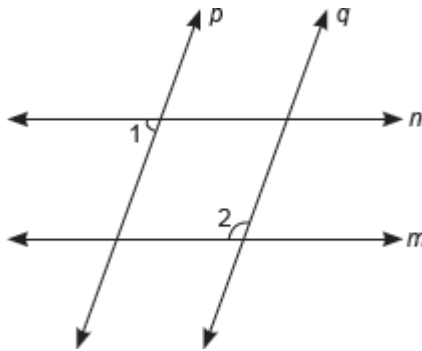


14. $ABCD$ is a parallelogram. AB is produced to E so that $BE = AB$. Prove the ED bisects BC .

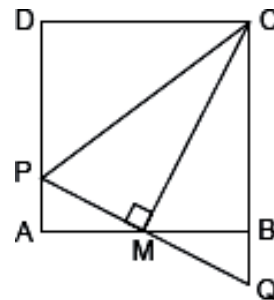
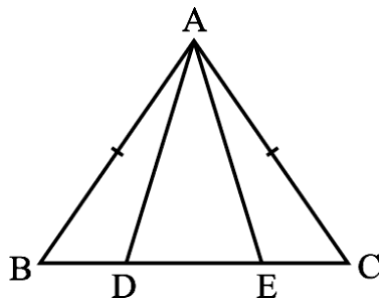
SECTION – C

Questions 15 to 17 carry 3 marks each.

15. In the given figure, $n \parallel m$ and $p \parallel q$ of $\angle 1 = 75^\circ$, prove that $\angle 2 = \angle 1 + \frac{1}{3}$ of a right angle.



16. In the given below left figure, $AB = AC$ and $BE = CD$. Prove that $AD = AE$.



17. In the given above right sided figure, $ABCD$ is a square. M is the midpoint of AB and $PQ \perp CM$. Prove that $CP = CQ$.

SECTION – D

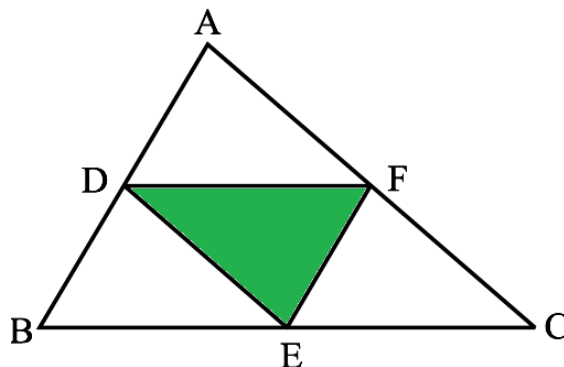
Questions 18 carry 5 marks.

18. Show that the quadrilateral formed by joining the mid-points of the sides of a square, is also a square.

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. In a school, group of Class IX students prepared Rangoli in triangular shape. Dimensions of $\triangle ABC$ are $AC = 26$ cm, $BC = 28$ cm, $AB = 25$ cm. Garland is to be placed along the side of $\triangle DEF$ which is formed by joining midpoints of sides of $\triangle ABC$.

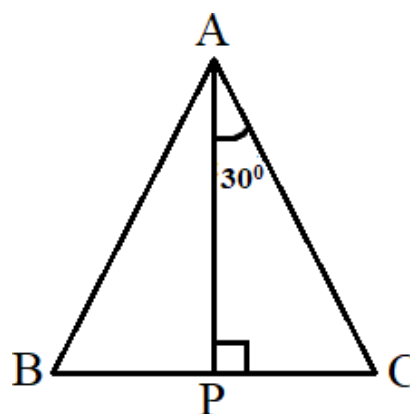
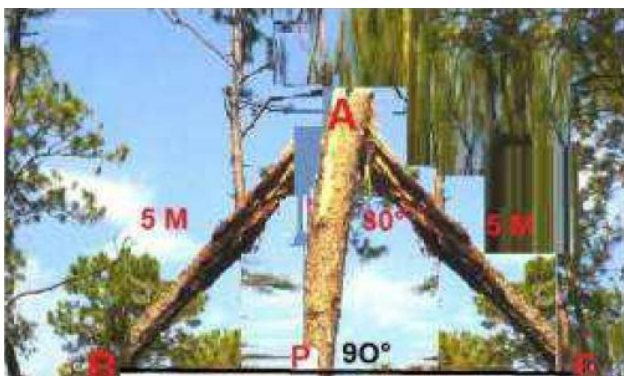


- (a) Show that ADEF, BDFE and DFCE are all parallelograms. (2)
(b) Find the length of garland. (2)

OR

- (b) Show that $\triangle ABC$ is divided into four congruent triangles (2)

20. Aditya and his friends went to a forest, they saw a big tree got broken due to heavy rain and wind. Due to this rain the big branches AB and AC with lengths 5m fell down on the ground. Branch AC makes an angle of 30° with the main tree AP. The distance of Point B from P is 4 m. You can observe that $\triangle ABP$ is congruent to $\triangle ACP$.



- (a) Show that $\triangle ABP$ is congruent to $\triangle ACP$ (1)
(b) Find the value of $\angle ACP$? (2)

OR

What is the total height of the tree? (2)

- (c) Find the value of $\angle BAP$? (1)