

MATHEMATICS

Chapter 10: Practical Geometry



Swotters

Important Questions

Multiple Choice Questions-

Question 1. In ΔRST , $R = 5$ cm, and $\angle SRT = 45^\circ$ and $\angle RST = 45^\circ$. Which criterion can be used to construct ΔRST ?

- (a) A.S.A. criterion
- (b) S.A.S. criterion
- (c) S.S.S. criterion
- (d) R.H.S. criterion

Question 2. Identify the criterion of construction of the equilateral triangle LMN given $LM = 6$ cm.

- (a) S.A.S. criterion
- (b) R.H.S. criterion
- (c) A.S.A. criterion
- (d) S.S.S. criterion

Question 3. The idea of equal alternate angles is used to construct which of the following?

- (a) A line parallel to a given line
- (b) A triangle
- (c) A square
- (d) Two triangles

Question 4. A Given $AB = 3$ cm, $AC = 5$ cm, and $\angle B = 30^\circ$, ΔABC cannot be uniquely constructed, with AC as base, why?

- (a) Two sides and included angle are given.
- (b) The other two angles are not given.
- (c) The vertex B cannot be uniquely located.
- (d) The vertex A coincides with the vertex C.

Question 5. A line and a point X not on it are given. Which of the following is used to draw a line parallel to p through X?

- (a) Equal corresponding angles.
- (b) Congruent triangles.
- (c) Angle sum property of triangles.
- (d) Pythagoras' theorem.

Question 6. ΔPQR is such that $\angle P = \angle Q = \angle R = 60^\circ$ which of the following is

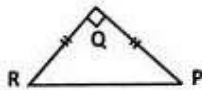
true?

- (a) ΔPQR is equilateral.
- (b) ΔPQR is acute angled.
- (c) Both [a] and [b]
- (d) Neither [a] nor [b]

Question 7. Which vertex of ΔABC is right angled if $\overline{AB} = 8$ cm, $\overline{AC} = 6$ cm, and $\overline{BC} = 10$ cm,?

- (a) $\angle C$
- (b) $\angle A$
- (c) $\angle B$
- (d) A or C

Question 8. An isosceles triangle is constructed as shown in the figure.



Which of the given statements is incorrect?

- (a) \overline{PR} is the hypotenuse of ΔPQR .
- (b) ΔPQR is an equilateral triangle.
- (c) ΔPQR is a right angled triangle.
- (d) If right angled ΔPQR has its equal angles measuring 45° each.

Question 9. ΔPQR is constructed with all its angles measuring 60° each. Which of the following is correct?

- (a) ΔPQR is an equilateral triangle.
- (b) ΔPQR is isosceles triangle.
- (c) ΔPQR is a scalene triangle.
- (d) ΔPQR is a right angled triangle.

Question 10. How many perpendicular lines can be drawn to a line from a point not on it?

- (a) 1
- (b) 2
- (c) 0
- (d) Infinite

Question 11. Identify the false statement.

- (a) A triangle with three equal sides is called an equilateral triangle.

- (b) A triangle with a right angle is called a right angled triangle.
- (c) A triangle with two equal sides is called a scalene triangle.
- (d) A right angled triangle has two acute angles and a right angle.

Question 12. ΔPQR is constructed such that $PQ = 5$ cm, $PR = 5$ cm and $\angle RPQ = 50^\circ$ Identify the type of triangle constructed.

- (a) An isosceles triangle
- (b) An acute angled triangle
- (c) An obtuse angled triangle
- (d) Both [a] and [b]

Question 13. Which of the following is NOT constructed using a ruler and a set square?

- (a) A perpendicular to a line from a point not on it.
- (b) A perpendicular bisector of a line segment.
- (c) A perpendicular to a line at a point on the line.
- (d) A line parallel to a given line through a given point.

Question 14. Study the steps of construction given.

Step 1: Draw a ray OA.

Step 2: With O as center and any convenient radius draw an arc MN to cut OA at M.

Step 3: With M as center and the same radius draw an arc to cut MN at P.

Step 4: With P as center and the same radius, draw an arc to cut MN at Q.

Step 5: Draw OQ and produce it to D. An angle AOD is constructed.

What is the measure of $\angle AOD$?

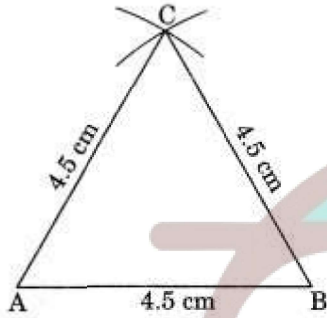
- (a) 60°
- (b) 30°
- (c) 120°
- (d) 45°

Question 15. In ΔXYZ , x, y and z denote the three sides. Which of the following is incorrect?

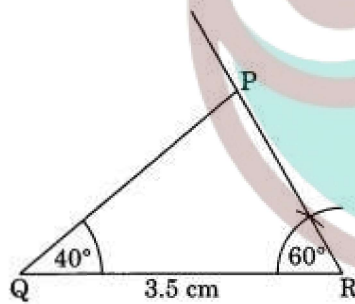
- (a) $x - y > z$
- (b) $x + z > y$
- (c) $x - y < z$
- (d) $x + y > z$

Very Short Questions:

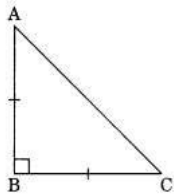
1. State whether the triangle is possible to construct if
 - (a) In $\triangle ABC$, $m\angle A = 80^\circ$, $m\angle B = 60^\circ$, $AB = 5.5$ cm
 - (b) In $\triangle PQR$, $PQ = 5$ cm, $QR = 3$ cm, $PR = 8.8$ cm
2. Draw an equilateral triangle whose each side is 4.5 cm.



3. Draw a $\triangle PQR$, in which $QR = 3.5$ cm, $m\angle Q = 40^\circ$, $m\angle R = 60^\circ$.

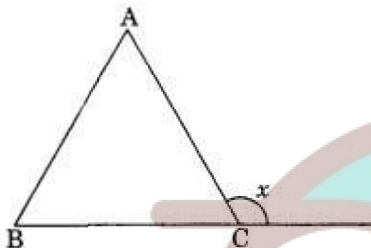


4. There are four options, out of which one is correct. Choose the correct one:
 - (i) A triangle can be constructed with the given measurement.
 - (a) 1.5 cm, 3.5 cm, 4.5 cm
 - (b) 6.5 cm, 7.5 cm, 15 cm
 - (c) 3.2 cm, 2.3 cm, 5.5 cm
 - (d) 2 cm, 3 cm, 6 cm
 - (ii) (a) $m\angle P = 40^\circ$, $m\angle Q = 60^\circ$, $AQ = 4$ cm
 - (b) $m\angle B = 90^\circ$, $m\angle C = 120^\circ$, $AC = 6.5$ cm
 - (c) $m\angle L = 150^\circ$, $m\angle N = 70^\circ$, $MN = 3.5$ cm
 - (d) $m\angle P = 105^\circ$, $m\angle Q = 80^\circ$, $PQ = 3$ cm
5. What will be the other angles of a right-angled isosceles triangle?

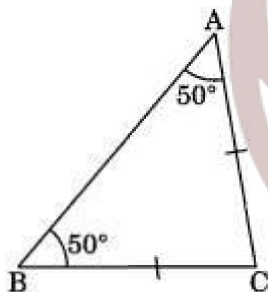


Short Questions :

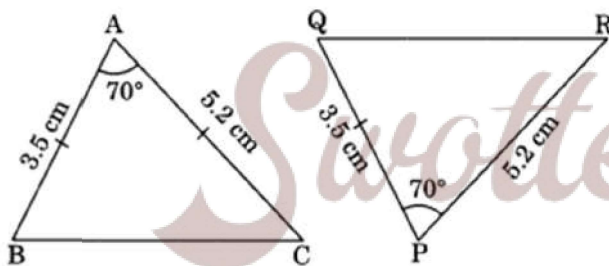
1. What is the measure of an exterior angle of an equilateral triangle?



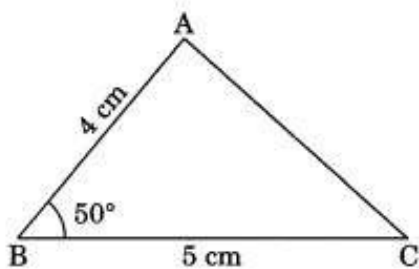
2. In $\triangle ABC$, $\angle A = \angle B = 50^\circ$. Name the pair of sides which are equal.



3. If one of the other angles of a right-angled triangle is obtuse, whether the triangle is possible to construct.
4. State whether the given pair of triangles are congruent.

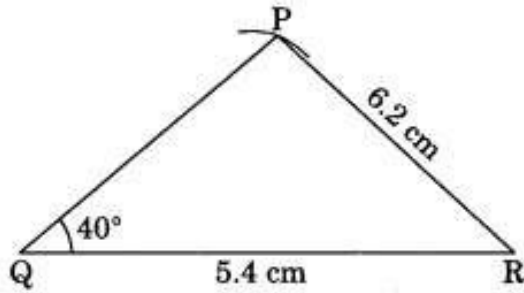


5. Draw a $\triangle ABC$ in which $BC = 5$ cm, $AB = 4$ cm and $m\angle B = 50^\circ$.

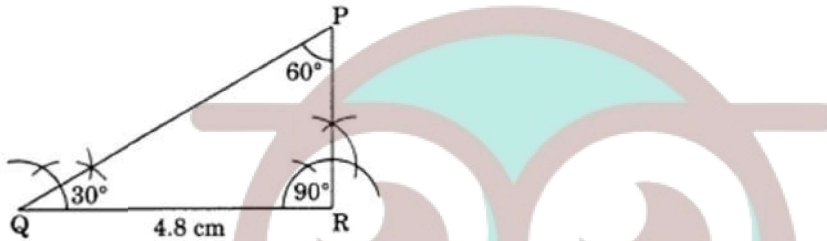


Long Questions :

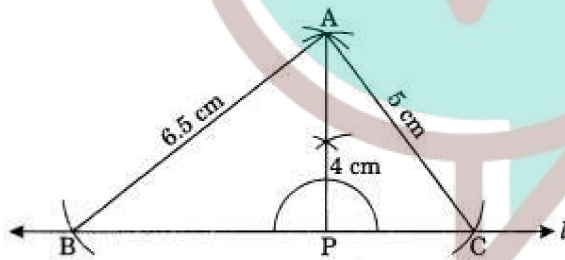
1. Draw ΔPQR in which $QR = 5.4$ cm, $\angle Q = 40^\circ$ and $PR = 6.2$ cm.



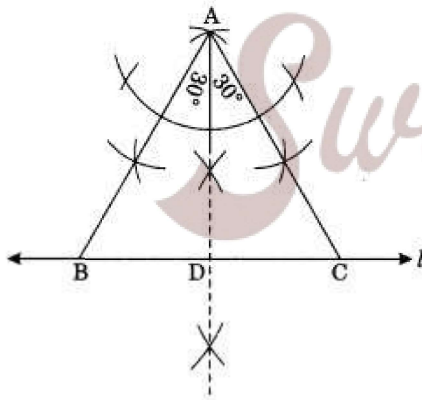
2. Construct a ΔPQR in which $m\angle P = 60^\circ$ and $m\angle Q = 30^\circ$, $QR = 4.8$ cm.



3. Draw an isosceles right-angled triangle whose hypotenuse is 5.8 cm.
4. Construct a ΔABC such that $AB = 6.5$ cm, $AC = 5$ cm and the altitude AP to BC is 4 cm.



5. Construct an equilateral triangle whose altitude is 4.5 cm.



Answer Key-

Multiple Choice questions-

1. (a) A.S.A. criterion
2. (d) S.S.S. criterion
3. (a) A line parallel to a given line.

4. (c) The vertex B cannot be uniquely located.
5. (a) Equal corresponding angles.
6. (c) Both [a] and [b]
7. (b) $\angle A$
8. (b) ΔPQR is an equilateral triangle.
9. (a) ΔPQR is an equilateral triangle.
10. (a) 1
11. (c) A triangle with two equal sides is called a scalene triangle.
12. (d) Both [a] and [b]
13. (b) A perpendicular bisector of a line segment.
14. (c) 120°
15. (a) $x - y > z$

Very Short Answer :

1. (a) $m\angle A = 80^\circ, m\angle B = 60^\circ$
 $m\angle A + m\angle B = 80^\circ + 60^\circ = 140^\circ < 180^\circ$
 So, ΔABC can be possible to construct.
 (b) $PQ = 5 \text{ cm}, QR = 3 \text{ cm}, PR = 8.8 \text{ cm}$
 $PQ + QR = 5 \text{ cm} + 3 \text{ cm} = 8 \text{ cm} < 8.8 \text{ cm}$
 or $PQ + QR < PR$
 So, the ΔPQR can not be constructed.
2. Steps of construction:
 - (i) Draw $AB = 4.5 \text{ cm}$.
 - (ii) Draw two arcs with centres A and B and same radius of 4.5 cm to meet each other at C.
 - (iii) Join CA and CB.
 - (iv) ΔCAB is the required triangle.
3. Steps of construction:
 - (i) Draw $QR = 3.5 \text{ cm}$.
 - (ii) Draw $\angle Q = 40^\circ, \angle R = 60^\circ$ which meet each other at P.
 - (iii) ΔPQR is the required triangle
4. (i) Option (a) is possible to construct.
 $1.5 \text{ cm} + 3.5 \text{ cm} > 4.5 \text{ cm}$
 (ii) Option (a) is correct.

$$m\angle P + m\angle Q = 40^\circ + 60^\circ = 100^\circ < 180^\circ$$

5. In right angled isosceles triangle ABC, $\angle B = 90^\circ$

$$\angle A + \angle C = 180^\circ - 90^\circ = 90^\circ$$

But $\angle A = \angle C$

$$\angle A = \angle C = \frac{90}{2} = 45^\circ$$

Hence the required angles are $\angle A = \angle C = 45^\circ$

Short Answer :

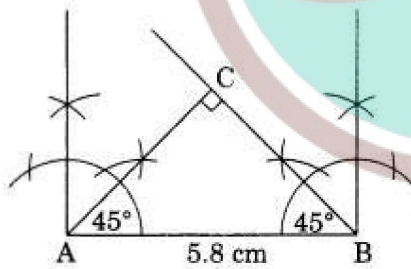
- We know that the measure of each interior angle = 60°
Exterior angle = $180^\circ - 60^\circ = 120^\circ$
- $\angle A = \angle B = 50^\circ$
 $AC = BC$ [\because Sides opposite to equal angles are equal]
Hence, the required sides are AC and BC.
- We know that the angles other than right angle of a right-angled triangle are acute angles.
So, such a triangle is not possible to construct.
Here, $AB = PQ = 3.5$ cm
 $AC = PR = 5.2$ cm
 $\angle BAC = \angle QPR = 70^\circ$
 $\triangle ABC = \triangle PQR$ [By SAS rule]
- Steps of construction:
 - Draw $BC = 5$ cm.
 - Draw $\angle B = 50^\circ$ and cut $AB = 4$ cm.
 - Join AC.
 - $\triangle ABC$ is the required triangle.
- Steps of construction:
 - Draw $QR = 5.4$ cm.
 - Draw $\angle Q = 40^\circ$.
 - Take R as the centre and with radius 6.2 cm, draw an arc to meet the former angle line at P.
 - Join PR.
 - $\triangle PQR$ is the required triangle.

Long Answer :

1. $m\angle Q = 30^\circ$, $m\angle P = 60^\circ$
 $m\angle Q + m\angle P + m\angle R = 180^\circ$ (Angle sum property of triangle)
 $30^\circ + 60^\circ + m\angle R = 180^\circ$
 $90^\circ + m\angle R = 180^\circ$
 $m\angle R = 180^\circ - 90^\circ$
 $m\angle R = 90^\circ$
2. Steps of construction:
 - (i) Draw $QR = 4.8$ cm.
 - (ii) Draw $\angle Q = 30^\circ$.
 - (iii) Draw $\angle R = 90^\circ$ which meets the former angle line at P.
 - (iv) $\angle P = 180^\circ - (30^\circ + 90^\circ) = 60^\circ$
 - (v) $\triangle PQR$ is the required triangle.

3. Right angled triangle is an isosceles triangle

Each of its acute angles = $\frac{90}{2} = 45^\circ$



Steps of construction:

- (i) Draw $AB = 5.8$ cm.
 - (ii) Construct $\angle A = 45^\circ$ and $\angle B = 45^\circ$ to meet each other at C.
 - (iii) $\angle C = 180^\circ - (45^\circ + 45^\circ) = 90^\circ$
 - (iv) $\triangle ACB$ is the required isosceles right angle triangle.
4. Steps of construction:
 - (i) Draw a line l and take any point P on it.
 - (ii) Construct a perpendicular to l at P.
 - (iii) Cut $AP = 4$ cm.
 - (iv) Draw two arcs with centre A and radii 6.5 cm and 5 cm to cut the line l at B and C respectively.
 - (v) Join AB and AC.
 - (vi) $\triangle ABC$ is the required triangle.

5. Steps of construction:
- (i) Draw any line l and take a point D on it.
 - (ii) Construct a perpendicular to l at D and cut $AD = 4.5$ cm.
 - (iii) Draw the angle of 30° at on either side of AD to meet the line l at B and C .
 - (iv) $\triangle ABC$ is the required equilateral triangle.



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