

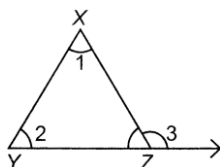
Practical Geometry

MATHEMATICAL REASONING

1. In $\triangle ABC$, if $AB = 7\text{ cm}$, $\angle A = 40^\circ$ and $\angle B = 70^\circ$, which criterion can be used to construct this triangle?

(a) ASA (b) SSS
(c) SAS (d) RHS

2. Which one of the following is true for the given triangle?



(a) $\angle 3 = \angle 1 + \angle 2$
(b) $\angle 1 = \angle 3 + \angle 2$
(c) $\angle 2 = \angle 1 + \angle 3$
(d) Both (A) and (B)

3. The ___ criterion is used to construct a triangle when the lengths of the three sides are given.

(a) SAS (b) SSS
(c) RHS (d) ASA

4. A triangle can be constructed by taking its sides as

(a) 1.8 cm, 2.6 cm, 4.4 cm
(b) 2 cm, 3 cm, 4 cm
(c) 2.4 cm, 2.4 cm, 6.4 cm
(d) 3.2 cm, 2.3 cm, 5.5 cm

5. A triangle can be constructed by taking two of its angles as

(a) 110° , 40° (b) 70° , 115°
(c) 135° , 45° (d) 90° , 90°

6. Which of the following sets of triangles could be the lengths of the sides of a right-angled triangle?

(a) 3 cm, 4 cm, 6 cm
(b) 9 cm, 16 cm, 26 cm
(c) 1.5 cm, 3.6 cm, 3.9 cm
(d) 7 cm, 24 cm, 26 cm

7. In which of the following cases, a unique triangle can be drawn?

(a) $AB = 4\text{ cm}$, $BC = 8\text{ cm}$ and $CA = 2\text{ cm}$
(b) $BC = 5.2\text{ cm}$, $\angle S = 90^\circ$ and $\angle C = 110^\circ$
(c) $XY = 5\text{ cm}$, $\angle X = 45^\circ$ and $\angle Y = 60^\circ$
(d) An isosceles triangle with the length of each equal side 6.2 cm.

8. Which of the following statements is INCORRECT?

(a) If length of any two sides of a triangle are 7 cm and 10 cm, then length of its third side lies between 3 cm and 17 cm.
(b) It is possible to construct a unique triangle if all its three angles are given.

(c) An angle of $7\frac{1}{2}^\circ$ can't be constructed

using compasses and ruler.
(d) None of these

ACHIEVERS SECTIONS (HOTS)

9. Which of the following steps is INCORRECT while constructing $\triangle XYZ$ if it is given that $XY = 6\text{ cm}$, $\angle ZXY = 30^\circ$ and $\angle XYZ = 100^\circ$

Step 1: Draw line XV of length 6 cm.

Step 2: At X, draw a ray XP making an angle of 30° with XY.

Step 3: At V, draw a ray YQ making an angle of 100° with YX.

Step 4: The point of intersection of the two rays XY and YQ is Z.

(a) Step 1 (b) Step 2 and Step 4
(c) Step 3 (d) Step 4

10. Arrange the given steps in CORRECT order, while constructing $\triangle PQR$ where $PM \perp QS$ and it is given that $QR = 4.2\text{ cm}$, $\angle Q = 120^\circ$ and $PQ = 3.5\text{ cm}$.

Step 1: Now, extend RQ to S and with P as centre and with a sufficient radius, draw an arc, cutting SQ at A and B.

Step 2. Along QX, set off $QP = 3.5\text{ cm}$.

Step 3. Draw a line segment $QR = 4.2 \text{ cm}$ and construct $\angle RQX = 120^\circ$.

Step 4. Joint PR.

Step 5. Joint PC, meeting RQ produced at M. Then. $PM \perp QS$

Step 6. With A as centre and radius more than half AB, draw an arc. Now with B as centre and with the same radius draw another arc, cutting the previous arc at C.

(a) $1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 5 \rightarrow 6$

(b) $4 \rightarrow 1 \rightarrow 2 \rightarrow 3 \rightarrow 5 \rightarrow 6$

(c) $2 \rightarrow 4 \rightarrow 3 \rightarrow 1 \rightarrow 5 \rightarrow 6$

(d) $3 \rightarrow 2 \rightarrow 4 \rightarrow 1 \rightarrow 6 \rightarrow 5$

11. State 'T' for true and 'F' for false.

(1) In a triangle, the measure of exterior angle is equal to the sum of the measure of interior opposite angles.

(2) The sum of the measures of the three angles of a triangle is 90° .

(3) A perpendicular is always at 90° to a given line or surface.

	(1)	(2)	(3)
(a)	T	T	F
(b)	T	F	F
(c)	T	F	T
(d)	F	T	F

12. Which of the following steps is INCORRECT while constructing $\triangle LMA$, right angled at M, given that $LN = 5 \text{ cm}$ and $MN = 3 \text{ cm}$?

Step 1. Draw MN of length 3 cm.

Step 2. At M, draw $MX \perp MN$. (L should be some where on this perpendicular).

Step 3. With N as centre, draw an arc of radius 5 cm. (L must be on this arc, since it is at a distance of 5 cm from N).

Step 4. L has to be on the perpendicular line MX as well as on the arc drawn with centre N. Therefore, L is the meeting point of these two and $\triangle LMA$ is obtained.

(a) Only Step 4

(b) Both Step 2 and Step 3

(c) Only Step 2

(d) None of these

13. Arrange the steps marked (i) to (v) in CORRECT order while constructing a line parallel to a given line, through a point not on the line using ruler and compasses only.

Step 1. Take a line 'l' and a point 'A' outside 'l'.

Step 2. Take any point S on l and join S to A

(i) Now with A as centre and the same radius as in previous step, draw an arc EF cutting AB at G.

(ii) With the same opening as in previous step and with G as centre, draw an arc cutting the arc EF at H.

(iii) With B as centre and a convenient radius, draw an arc cutting l at C and BA at D,

(iv) Now, join AH to draw a line 'm'.

(a) (i) \rightarrow (ii) \rightarrow (iv) \rightarrow (iii)

(b) (iii) \rightarrow (i) \rightarrow (ii) \rightarrow (iv)

(c) (iii) \rightarrow (ii) \rightarrow (i) \rightarrow (iv)

(d) (i) \rightarrow (ii) \rightarrow (iii) \rightarrow (iv)

ANSWER KEY

1. A	2. A	3. B	4. B	5. A
6. C	7. C	8. C	9. D	10. D
11. B	12. D	13. B		

SOLUTION

1. (a)

2. (a): $\angle 3 = \angle 1 + \angle 2$ (exterior angle property)

3. (b)

4. (b): A triangle can be constructed if sum of its any two sides is greater than the third side.

5. (a): A triangle can be constructed by taking sum of two of its angles less than 180° .

6. (c): If the sides of a triangle obey Pythagoras rule then triangle is right angled triangle.

Here, $(1.5)^2 + (3.6)^2 = 2.25 + 12.96 = 15.21 \text{ cm}$

and $(3.9)^2 = 15.21 \text{ cm}$

$\therefore (1.5)^2 + (3.6)^2 = (3.9)^2$

7. (c): A triangle is possible if

(i) Sum of any two sides must be greater than the third side.

(ii) Sum of all angles must be equal to 180° .

So, in options (A) and (B) triangle are not possible. In option (D) we can draw more than one isosceles triangle with side length 6.2 cm.

So, triangle is not unique.

8. (c)

9. (d): The correct step is the point of intersection of the two rays XP and XQ is Z.

10. (d)

11. (b)

12. (d)

13. (b)