Practical Geometry

Multiple Choice Questions

1. Which among the following is used to construct a triangle?

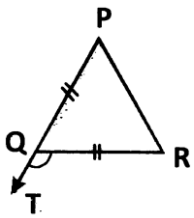
(a) The lengths of the three sides.

(b) The perimeter of the triangle.

(c) The measures of three angles.

(d) The names of three vertices.

2. In the given figure, find the measure of $\angle ROT$, if $PQ = QR$ and $\angle QPR = 60^o$.



(a) 60^o (b) 140^o

(c) 120^o (d) 100^o

3. A triangular sign board is isosceles. If the unequal side is 7 cm and one of the equal sides is 6 cm, what is the measure of the third side?

(a) 5cm (b) 6cm

(c) 7cm (d) Either (A) or (C)

4. Which of the following statements is incorrect?

(a) The sum of angles in a triangle is 2 right angles.

(b) The exterior angle of a triangle is equal to the interior angle of the triangle.

(c) The hypotenuse is the longest side of a right angled triangle.

(d) All the above.

5. Identify the true statement.

(a) A triangle with 3 equal sides is isosceles.

(b) A triangle with a 110^o angle is right angled.

(c) A triangle with 3 acute angles is acute angled.

(d) A triangle with 2 equal sides is equilateral.

6. In which of the following cases is the construction of a triangle not possible?

(a) Measures of 3 sides are given.

(b) Measures of 2 sides and an included angle are given.

(c) Measures of 2 angles and a side are given.

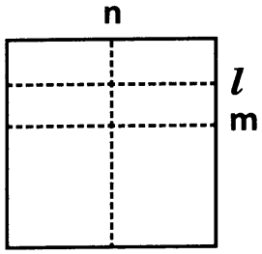
(d) Measures of 3 angles are given.

7. A Choose the correct option in which a triangle CANNOT be constructed with the given lengths of sides.

(a) 3 cm, 4 cm, 5 cm (b) 7 cm, 6 cm, 5 cm

(c) 10 cm, 7 cm, 2 cm (d) 12 cm, 8 cm, 6 cm

(8-10): David folds a sheet of paper. The dotted lines as shown in the figure are the creases formed, which are named as l, m and n.



8. Which of the following is true?

(a) l // m (b) l // n

(c) n// m (d) Either (B) or (C)

9. What can you say about lines I and n?

(a) $l // n$

(b) $l \perp n$

(c) I is the same line as n

(d) Neither (A) nor (B)

10. What do you call the line n with respect to the lines I and m?

(a) n is a line parallel to I and m.

(b) n is a line parallel to I only.

(c) n is a transversal.

(d) n is a line parallel to m only.

11. Which of the following is used to draw a line parallel to a given line?

(a) A protractor

(b) A set square

(c) A ruler

(d) A ruler and compasses

12. How many parallel lines can be drawn passing through a point not on the given line?

(a) 2 (b) 1

(c) 3 (d) 0

13. Based on the sides of a triangle, which of the following is a classification of triangles?

(a) A right angled triangle

(b) An acute angled triangle

(c) An obtuse angled triangle

(d) An isosceles triangle

14. Which type of triangle is in the classification based on angles?

(a) An equilateral triangle

(b) An isosceles triangle

(c) A right angled triangle

(d) A scalene triangle

15. In which of the following cases can a triangle be constructed?

(a) Measures of three sides are given.

(b) Measures of two sides and an included angle are given.

(c) Measures of two angles and the side between them are given.

(d) All the above.

16. The measurements of ΔDEF are $EF = 8.4\ cm$, $\angle E = 103^o$ and $\angle F = 85^o$.

Which of the following is correct?

(a) ΔDEF can be constructed.

(b) ΔDEF is an obtuse angled triangle.

(c) ΔDEF cannot be constructed.

(d) ΔDEF is an acute angled triangle.

17. 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) $x + y > z$

18. Which of the following can be used to construct a 30^o angle?

(a) Construct a 60^o angle using compasses and bisect it.

(b) Construct a perpendicular bisector of a line segment.

(c) Construct the bisector of any angle.

(d) Construct an angle congruent to any given angle.

19. Study the steps of construction given.

Step:1 Draw a ray OA.

Step:2 With O as centre and any convenient radius draw an arc MN to cut $\overrightarrow{OA}$ at M. Step:3 With M as centre and the same radius draw an arc to cut MN at P. Step:4 With P as centre 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^o (b) 30^o

(c) 120^o (d) 45^o

20. Satish followed the steps given in the box.

Step!: Construct an angle of 90°. Step 2: Bisect the 90° angle. Step 3: Bisect one of the angles obtained in step 2.

Which steps is not required to construct a 45^o angle?

(a) Step1 (b) Step 2

(c) Step 3 (d) Steps 2 and 3

21. 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.

22. Given $PQ = 4\ cm$, $QR = 3.5\ cm$ and $RP = 4.5\ cm$, what type of a triangle can be constructed?

(a) An acute angled triangle

(b) An obtuse angled triangle

(c) An equilateral triangle

(d) A right angled triangle

23. ΔPQR is constructed such that $PQ = 5\ cm$, $PR = 5\ cm$ and $\angle RPQ = 50^o$ 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)

24. Identify the condition when a triangle can be constructed?

(a) All three acute angles are given.

(b) A side and an acute angles are given.

(c) Two obtuse angles are given.

(d) All given sides are equal.

25. 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.

26. Identify the condition to be checked before constructing a triangle.

(a) Sum of the three angles is 180^o.

(b) The sum of any two of the sides is greater than the third side.

(c) The difference of any two sides is lesser than the third side.

(d) All the above.

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

(a) 1 (b) 2

(c) 0 (d) Infinite

28. In ΔXYZ, $\overline{XY} > \overline{YZ} > \overline{ZX}$ Which of the following is the smallest angle?

(a) X (b) Z

(c) Y (d) $X = Y = Z$

29. ΔPQR is constructed with all its angles measuring 60^o each. Which of the following is correct?

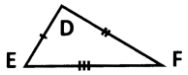
(a) ΔPQR is an equilateral triangle.

(b) ΔPQR is isosceles triangle.

(c) ΔPQR is a scalene triangle.

(d) ΔPQR is a right angled triangle.

30. A triangle is constructed as shown in the figure.



Which of the following is not correct about s ΔDEF

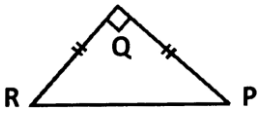
(a) ΔDEF has all its sides equal.

(b) ΔDEF is an acute angled triangle.

(c) ΔDEF is a scalene triangle.

(d) ΔDEF is not an equilateral triangle.

31. 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^o each.

32. In ΔABC, $\angle C = 50^o$ and $\angle A = \angle B$. What is the measure of $\angle A$?

(a) 75^o (b) 80^o

(c) 65^o (d) 45^o

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

(a) $\angle C$ (b) $\angle A$

(c) $\angle B$ (d) A or C

34. A triangle PQR is constructed with $PQ = 10cm$, $PR = 8cm$ and $\angle P = 90^o$. Identify the correct classification of ΔPQR.

	Based on sides	Based on angles
(A)	Scalene	Right angled
(B)	Isosceles	Acute angled
(C)	Scalene	Acute angled
(D)	Isosceles	Right angled

35. ΔPQR is such that $\angle P = \angle Q = \angle R = 60^o$ ^ ^ which of the following is true?

(a) A PQR is equilateral.

(b) APQR is acute angled.

(c) Both (A) and (B)

(d) Neither (A) nor (B)

36. Which of the following are the measures of a triangle that can be constructed using the S.S.S. criterion?

(a) $\overline{XY} = 6cm, \angle X = 40^o, \angle Y = 70^o$

(b) $\overline{DE} = 8cm, \overline{EF} = 7cm, \overline{FD} = 9cm$

(c) $\overline{PQ} = 4cm, \overline{QR} = 6cm, \angle Q = 80^o$

(d) $\overline{AB} = 5cm, \text{BC} = 4cm, \angle C = 90^o$

37. A line panda 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.

38. To which of these triangles is the Pythagoras' property related?
(a) A scalene triangle.
(b) An acute angled triangle.
(c) A right angled triangle.
(d) An obtuse angled triangle.

39. A Given $AB = 3\ cm,\ AC = 5\ cm,$ and $\angle B = 30^o$, 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.

40. A triangle ΔPQR with $\angle Q = 90^o$, $QR = 8\ cm$ and $PR = 10\ cm$ is constructed.
What would be the measure of PQ?
(a) $3cm$ (b) $4cm$
(c) $10cm$ (d) $6cm$

41. 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

42. In ΔABC, the measures of two sides are given and $\angle A$ is a right angle. Which of these properties is used to construct the triangle?
(a) S.S.S. property (b) R.H.S. property
(c) S.A.S. property (d) A.S.A. property

43. 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

44. A right triangle DEF is constructed with $DE = 5\ cm,\ \angle F = 90^o$ and $DF = 4\ cm$. Choose the correct statement from the following.
(a) DE is the hypotenuse of ΔDEF.
(b) $\angle E + \angle D = 90^o$
(c) $EF = 3cm$
(d) All the above.

45. In ΔRST, $R = 5cm$, and $\angle SRT = 45^o$ and $\angle RST = 45^o$. 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

Solution

1. (A) S.S.S. criterion can be used indirectly to construct a triangle given the lengths of its three sides.

2. (C) ΔPQR is isosceles since $PQ = QR$.

$\therefore \quad \angle QPR = \angle QRP = 60^o$

$\angle RQT$ is the exterior angle of ΔPQR which is equal to the sum of interior opposite angles $\angle P$ and $\angle R$.

Hence, $\angle RQT = 60^o + 60^o = 120^o$.

3. (B) Not available

4. (B) Not available

5. (C) Not available

6. (D) Not available

7. (C) The difference of any two sides of a triangle must be less than the third side.

This property of triangles is not satisfied by the given measurements as $10 - 7 = 3 > 2$ and $10 - 2 = 8 > 7$, though $7 - 2 = 5 < 10$ is true.

8. (A) Clearly, $l \,||\,$ m is true.

9. (B) A 90^o angle is formed at the intersection of l and n. So $l \perp n$.

10. (C) 'n' cuts I and m at distinct points and also I and m are parallel. So, n is called the transversal.

11. (D) A line parallel to a given line can be drawn using a ruler and a compass.

12. (B) Through a given point, an infinite number of lines can be drawn. But only one of them will be parallel to the given line.

13. (D) Not available

14. (C) Not available

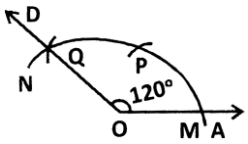
15. (D) Not available

16. (C) The triangle cannot be constructed as it does not satisfy the angle sum property.

17. (A) The difference of two sides of a triangle is less than its third side.

18. (A) Bisecting a 60^o angle results in a 30^o angle.

19. (C) The given steps of construction are to construct an angle of 120^o.



20. (C) Following steps 1 and 2, an angle of 45^o is constructed. So step 3 is not required.

21. (B) Not available

22. (A) Not available

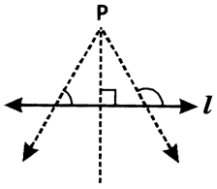
23. (D) Not available

24. (A) Not available

25. (C) Not available

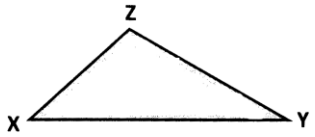
26. (D) Not available

27. (A)



As can be seen from the given figure, one and only one perpendicular line can be drawn to a given line from a point not on it.

28. (C)



Given $\overline{XY} > \overline{YZ} > \overline{ZX}$

$\Rightarrow \angle Z > \angle X > \angle Y$

$\Rightarrow$ The smallest angle is $\angle Y$.

29. (A) Not available

30. (A) Not available

31. (B) Not available

32. (C) Not available

33. (B) From the given measurements, $\overline{BC}$ is the hypotenuse. The angle opposite to $\overline{BC}$ is $\angle A$ which is a right angle.

34. (A) Not available

35. (C) In ΔPQR since all the angles are acute, it is acute angled. Also since all the angles are equal, it is equilateral.

36. (B) Since the measures of all the three sides are given, the triangle can be constructed using the S.S.S. criterion.

37. (A) Corresponding angles of parallel lines are equal.

38. (C) Not available

39. (C) Not available

40. (D) Not available

41. (A) Not available

42. (B) Not available

43. (D) Since ALMN is equilateral the measurement of one side is used for the other two sides of the triangle.

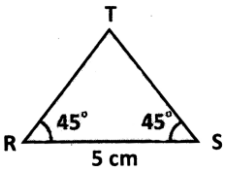
Hence ALMN can be constructed by S.S.S. criterion.

44. (D) By Pythagoras' theorem, one of the perpendicular sides is 3 cm. and by angle sum property,

$\angle D + \angle E = 180^\circ - \angle F$

$= 180^\circ - 90^\circ = 90^\circ$

45. (A)



Clearly, from the figure two angles and the included side are given. So, A.S.A. criterion can be used to construct ARST.