

Ex - 49

1. (a) The vertices of the triangle are L, M, N.  
(b) The angles of the triangle are  $\angle MLN, \angle LNM, \angle LMN$ .  
(c) The sides of the triangle are LM, MN, NL.

2. A triangle has (a) Three ~~angles~~ sides.  
(b) Three angles  
(c) Three vertices.

3. (a) As we know, sum of three angles of a triangle is  $180^\circ$ .

$$\begin{aligned}\angle ABC = 81^\circ, \angle ACB = 45^\circ, \angle BAC &= 180^\circ - (81^\circ + 45^\circ) \\ &= 180^\circ - 126^\circ = 54^\circ\end{aligned}$$

$$\begin{aligned}\text{(b) } \angle ABC = 90^\circ, \angle ACB = 45^\circ, \angle BAC &= 180^\circ - (90^\circ + 45^\circ) \\ &= 180^\circ - 135^\circ = 45^\circ\end{aligned}$$

$$\begin{aligned}\text{(c) } \angle ABC = 120^\circ, \angle ACB = 40^\circ, \angle BAC &= 180^\circ - (120^\circ + 40^\circ) \\ &= 180^\circ - 160^\circ = 20^\circ\end{aligned}$$

$$\begin{aligned}\text{(d) } \angle ABC = 70^\circ, \angle ACB = 70^\circ, \angle BAC &= 180^\circ - (70^\circ + 70^\circ) \\ &= 180^\circ - 140^\circ = 40^\circ\end{aligned}$$

4. In  $\Delta ABC$  if,

$$(a) \angle A = 45^\circ, \angle B = 65^\circ, \therefore \angle C = 180^\circ - (45^\circ + 65^\circ) \\ = 180^\circ - 110^\circ = 70^\circ$$

$$(b) \angle BAC = 120^\circ, \angle ABC = 30^\circ, \therefore \angle BCA = 180^\circ - (120^\circ + 30^\circ) \\ = 180^\circ - 150^\circ = 30^\circ$$

$$(c) \angle A = \angle C = 75^\circ, \therefore \angle B = 180^\circ - (75^\circ + 75^\circ) \\ = 180^\circ - 150^\circ = 30^\circ$$

(d)  $\angle A = \angle B$  and  $\angle C = 90^\circ$ ,

$$\text{Let } \angle A = \angle B = x$$

$$\therefore x + x + 90^\circ = 180^\circ$$

$$\therefore \angle A = \angle B = 45^\circ$$

$$2x = 180^\circ - 90^\circ = 90^\circ$$

$$x = 90^\circ / 2 = 45^\circ$$

(e)  $\angle A = \angle B = \angle C$

$$\text{Let, } \angle A = \angle B = \angle C = x$$

$$\therefore x + x + x = 180^\circ$$

$$\therefore \angle A = \angle B = \angle C = 60^\circ$$

$$3x = 180^\circ$$

$$x = 180^\circ / 3 = 60^\circ$$

5. (a)  $90^\circ, 60^\circ, 30^\circ$  ( $90^\circ + 60^\circ + 30^\circ = 180^\circ$ )

(c)  $59^\circ, 60^\circ, 61^\circ$  ( $59^\circ + 60^\circ + 61^\circ = 180^\circ$ )

(f)  $54^\circ, 54^\circ, 72^\circ$  ( $54^\circ + 54^\circ + 72^\circ = 180^\circ$ )

6. Let,  $\angle A = \angle B = \angle C = 60^\circ$  ( $60^\circ + 60^\circ + 60^\circ = 180^\circ$ )

If all the angles are equal then the angles of a triangle measure  $60^\circ$  each.

- 7.
- (a)  $AB = 3 \text{ cm} = a$   
 $BC = 4 \text{ cm} = b$   
 $CA = 1 \text{ cm} = c$
- $$a^2 + b^2 = c^2$$
- $$(3)^2 + (4)^2 = (1)^2$$
- $$9 + 16 \neq 1 \quad (\text{triangle not possible})$$
- (b)  $AB = 5 \text{ cm} = a$   
 $BC = 7 \text{ cm} = b$   
 $CA = 8 \text{ cm} = c$
- $$a^2 + b^2 = c^2$$
- $$(5)^2 + (7)^2 = (8)^2$$
- $$25 + 49 \neq 64 \quad (\text{triangle not possible})$$
- (c)  $AB = 9 \text{ cm} = a$   
 $BC = 4 \text{ cm} = b$   
 $CA = 3 \text{ cm} = c$
- $$a^2 + b^2 = c^2$$
- $$(9)^2 + (4)^2 = (3)^2$$
- $$81 + 16 \neq 9 \quad (\text{triangle not possible})$$
- (d)  $AB = 10 \text{ cm} = a$   
 $BC = 7 \text{ cm} = b$   
 $CA = 8 \text{ cm} = c$
- $$a^2 + b^2 = c^2$$
- $$(10)^2 + (7)^2 = (8)^2$$
- $$100 + 49 \neq 64 \quad (\text{triangle not possible})$$

- 8.
- (a) All sides are equal = Equilateral triangle  
 (b) Two sides are equal = Isosceles triangle  
 (c) All sides are unequal = Scalene triangle

- 9.
- (a) If in the  $\triangle ABC$ ,  $\angle A = 60^\circ$  and  $\angle C = 30^\circ$  then the triangle is Right-angled.  $[180 - (60 + 30) = 90^\circ]$
- (b) If in the  $\triangle PQR$ ,  $\angle P = 50^\circ$  and  $\angle R = 20^\circ$  then the triangle is Obtuse-angled.  $[180 - (50 + 20) = 110^\circ]$
- (c) If in the  $\triangle LMN$ ,  $\angle L = 74^\circ$  and  $\angle N = 25^\circ$  then the triangle is Acute-angled.  $[180 - (75 + 25) = 80^\circ]$

10. (a)  $\angle ACB = 60^\circ$ ,  $\angle BAC = 50^\circ$

$$\therefore \angle ABC = 180^\circ - (60^\circ + 50^\circ) = 180^\circ - 110^\circ = 70^\circ$$

(b)  $\triangle ABC$  is a Acute-angled triangle.

(c)  $\triangle PQR$  is a Isosceles triangle. (2 sides are equal)

10. (d)  $\triangle LMN$  is an Equilateral triangle. (all sides are equal)  
(e)  $\angle L$  measures  $60^\circ$ .
11. (a) A triangle is called equilateral if its all sides are equal.  
(b) A triangle is called isosceles if its two sides are equal.  
(c) A triangle is called scalene if its all sides are unequal.  
(d) A triangle is called right-angled if its one angle is  $90^\circ$ .
12. (a) A triangle can have two acute angles.  T   
(b) A triangle can have two obtuse angles.  F   
(c) A triangle can have two right angles.  F   
(d) A triangle can have one obtuse angle and one right angle.  F   
(e) A triangle can have all its angles acute.  T
13. (a) If in the  $\triangle ABC$ ;  $AB = BC = CA$  then  $\triangle ABC$  is equilateral.  
(b) If in the  $\triangle ABC$ ,  $AB = BC$  then  $\triangle ABC$  is isosceles.  
(c) If in the  $\triangle ABC$ ,  $\angle A = 90^\circ$  then the hypotenuse is BC.  
~~(d) If in the  $\triangle ABC$ ,  $\angle A = 90^\circ$  then the hypotenuse is AB.~~