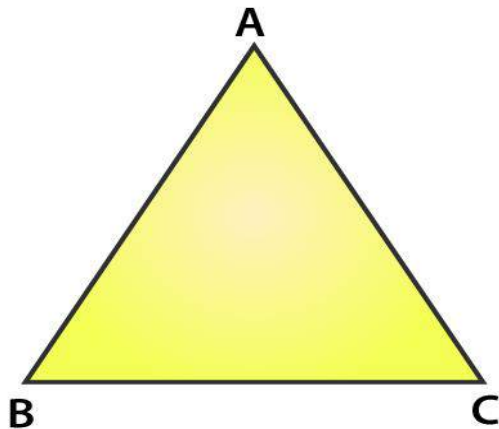


EXERCISE 16A

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1. Take three noncollinear points A, B, and C on a page of your notebook. Join AB, BC and CA. What figure do you get?

- Name: (i) the side opposite to $\angle C$
 (ii) the angle opposite to the side BC
 (iii) the vertex opposite to the side CA
 (iv) the side opposite to the vertex B



Solution

By joining three noncollinear points we get a triangle A, B, C

- (i) The side opposite to $\angle C$ is AB
 (ii) The angle opposite to the side BC is $\angle A$
 (iii) The vertex opposite to the side CA is B
 (iv) The side opposite to the vertex B is AC

2. The measures of two angles of a triangle are 72° and 58° . Find the measure of the third angle.

Solution

Given the measure of two angles of a triangle are 72° and 58°

Let the third angle be x

Sum of the measures of all angles of a triangle = 180°

$$\therefore x + 72^\circ + 58^\circ = 180^\circ$$

$$x + 130^\circ = 180^\circ$$

$$x = 180^\circ - 130^\circ$$

$$x = 50^\circ$$

Hence, the measure of third angle in a triangle is 50°

3. The angles of a triangle are in the ratio 1 : 3 : 5. Find the measure of each of the angles.

Solution

Given the angle of a triangle are in the ratio 1: 3: 5

Let the measures of the angles of a triangle be 1x, 2x and 3x

We know that sum of the measures of all angles of a triangle is 180°

$$\therefore 1x + 3x + 5x = 180^\circ$$

$$9x = 180^\circ$$

$$x = 180^\circ / 9$$

$$x = 20^\circ$$

$$1x = 1 \times 20^\circ = 20^\circ$$

$$3x = 3 \times 20^\circ = 60^\circ$$

$$5x = 5 \times 20^\circ = 100^\circ$$

\therefore The measures of the angles are 20° , 60° and 100°

4. One of the acute angles of a right triangle is 50° . Find the other acute angle.

Solution

We know that a triangle whose one angle measures 90° is called a right angled triangle.

Given that one of the acute angle of a right triangle is 50°

Let the third angle be x

We know that sum of the measures of all angles of a triangle is 180°

$$\therefore 90^\circ + 50^\circ + x = 180^\circ$$

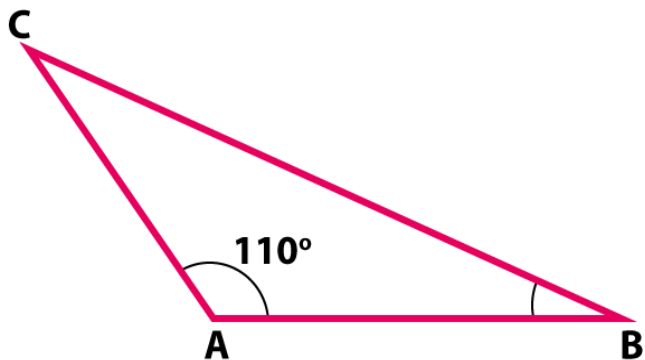
$$140^\circ + x = 180^\circ$$

$$x = 180^\circ - 140^\circ$$

$$x = 40^\circ$$

5. One of the angles of a triangle is 110° and the other two angles are equal. What is the measure of each of these equal angles?

Solution



Given one of the angle of a triangle is 110° and the other two angles are equal

We know that sum of the measures of all angles of a triangle is 180°

$$\therefore \angle A + \angle B + \angle C = 180^\circ$$

$$110^\circ + \angle B + \angle C = 180^\circ$$

$$110^\circ + \angle B + \angle C = 180^\circ$$

$$110^\circ + \angle B + \angle B = 180^\circ$$

$$110^\circ + 2\angle B = 180^\circ$$

$$2\angle B = 180^\circ - 110^\circ$$

$$2\angle B = 70^\circ$$

$$\angle B = 70^\circ / 2$$

$$\angle B = 35^\circ$$

Hence, $\angle C = 35^\circ$

\therefore The measure of each angles are

$$\angle A = 110^\circ \quad \angle B = 35^\circ \quad \angle C = 35^\circ$$

6. If one angle of a triangle is equal to the sum of other two, show that the triangle is a right triangle.

Solution

Given $\angle A = \angle B + \angle C$

We know that sum of the measures of all angles of a triangle is 180°

$$\therefore \angle A + \angle B + \angle C = 180^\circ$$

$$\angle B + \angle C + \angle B + \angle C = 180^\circ$$

$$2\angle B + 2\angle C = 180^\circ$$

$$2(\angle B + \angle C) = 180^\circ$$

$$\angle B + \angle C = 180^\circ / 2$$

$$\angle B + \angle C = 90^\circ$$

$$\angle A = 90^\circ$$

∴ This shows that the triangle is a right triangle.



EXERCISE 16B

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OBJECTIVE QUESTIONS

Mark (✓) against the correct answer in each of the following:

1. How many parts does a triangle have?

- (a) 2
- (b) 3
- (c) 6
- (d) 9

Solution

A triangle has 6 parts, three sides and three angles

Option (c) is the correct answer.

2. With the angles given below, in which case the construction of triangle is possible?

- (a) $30^\circ, 60^\circ, 70^\circ$
- (b) $50^\circ, 70^\circ, 60^\circ$
- (c) $40^\circ, 80^\circ, 65^\circ$
- (d) $72^\circ, 28^\circ, 90^\circ$

Solution

We know that sum of the measures of all angles of a triangle is 180°

- (a) $30^\circ + 60^\circ + 70^\circ = 160^\circ$ (which is not equal to sum of angles of a triangle)
- (b) $50^\circ + 70^\circ + 60^\circ = 180^\circ$ (which is equal to sum of angles of a triangle)
- (c) $40^\circ + 80^\circ + 65^\circ = 185^\circ$ (which is not equal to sum of angles of a triangle)
- (d) $72^\circ + 28^\circ + 90^\circ = 190^\circ$ (which is not equal to sum of angles of a triangle)

Option (b) is the correct answer

3. The angles of a triangle are in the ratio 2 : 3 : 4. The largest angle is

- (a) 60°
- (b) 80°
- (c) 76°
- (d) 84°

Solution

Given the angles of a triangle are in the ratio 2: 3: 4

Let the measure of the given angles be $2x$, $3x$ and $4x$

Sum of the measures of all angles of triangle is 180°

$$\therefore 2x + 3x + 4x = 180^\circ$$

$$9x = 180^\circ$$

$$x = 180^\circ / 9$$

$$x = 20^\circ$$

$$2x = 2 \times 20^\circ = 40^\circ$$

$$3x = 3 \times 20^\circ = 60^\circ$$

$$4x = 4 \times 20^\circ = 80^\circ$$

Hence, the largest angle is 80°

Option (b) is the correct answer.

4. The two angles of a triangle are complementary. The third angle is

- (a) 60°
- (b) 45°
- (c) 36°

(d) 90°

Solution

Given two angles of a triangle are complementary if their sum is 90°

Let the two angles be x and y such that $(x + y) = 90^\circ$

Let the third angle be z

Sum of the measures of all angles of triangle is 180°

$$x + y + z = 180^\circ$$

$$90^\circ + z = 180^\circ$$

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

$$z = 90^\circ$$

Option (d) is the correct answer.

5. One of the base angles of an isosceles triangle is 70° . The vertical angle is

(a) 60°

(b) 80°

(c) 40°

(d) 35°

Solution

Given the base angle of an isosceles triangle is 70°

Let $\angle A = 70^\circ$

Since the triangle is an isosceles triangle, we know that the angles opposite to the equal sides of an isosceles triangle are equal

$$\therefore \angle B = 70^\circ$$

Let the third angle be C

Sum of the measures of all angles of triangle is 180°

$$\angle A + \angle B + \angle C = 180^\circ$$

$$70^\circ + 70^\circ + \angle C = 180^\circ$$

$$140^\circ + \angle C = 180^\circ$$

$$\angle C = 180^\circ - 140^\circ$$

$$\angle C = 40^\circ$$

Option (c) is the correct answer.

6. A triangle having sides of different lengths is called

(a) an isosceles triangle

(b) an equilateral triangle

(c) a scalene triangle

(d) a right triangle

Solution

A triangle having sides of different lengths is called a scalene triangle

Option (c) is the correct answer.