

Exercise 16A

PAGE NO: 196

1.

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.

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.

Solution

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

Let the measures of the angles of a triangle be $1x$, $3x$ and $5x$

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°

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4.

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°

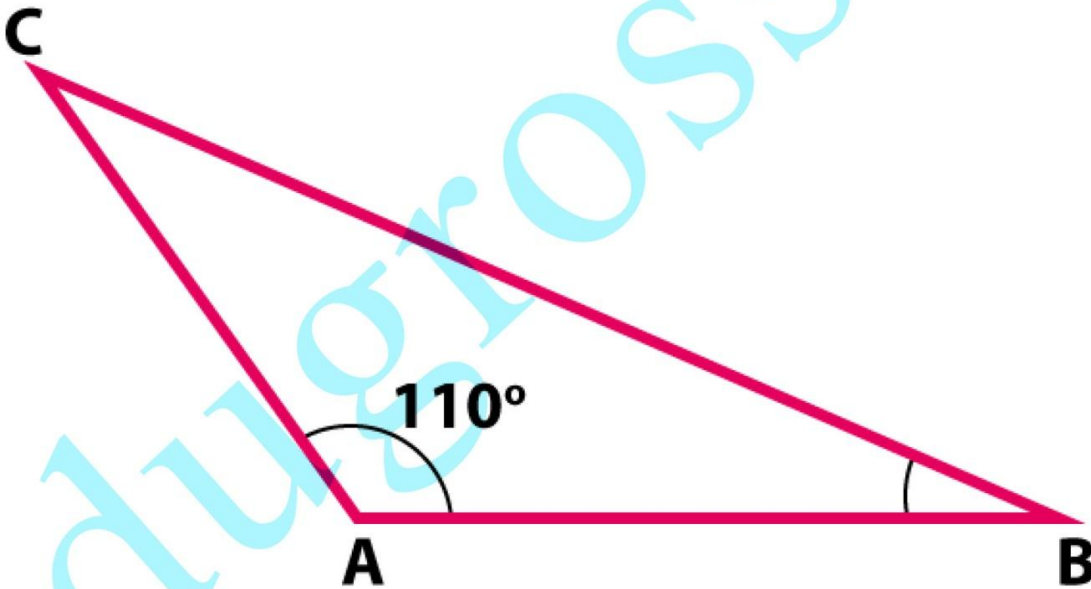
$$\therefore 90^\circ + 50^\circ + x = 180^\circ$$

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

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

$$x = 40^\circ$$

5.

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°

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

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

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

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

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

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

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

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

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

$$\text{Hence, } \angle C = 35^\circ$$

\therefore The measure of each angles are

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

6.

Solution

$$\text{Given } \angle A = \angle B + \angle C$$

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

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

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

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

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

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

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

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

\therefore This shows that the triangle is a right triangle.

Exercise 16B

PAGE NO: 197

1.

Solution

A triangle has 6 parts, three sides and three angles

Option (c) is the correct answer.

2.

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.

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.

Solution

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

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

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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.

Solution

Given the base angle of an isosceles triangle is 70°

$$\text{Let } \angle A = 70^\circ$$

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.

Solution

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

Option (c) is the correct answer.