Exercise 9.1

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Question 1: In a ΔABC, if $\angle A = 55^0$, $\angle B = 40^0$, find $\angle C$.

Solution:
Given: $\angle A = 55^0$, $\angle B = 40^0$

We know, sum of all angles of a triangle is 180^0

$\angle A + \angle B + \angle C = 180^0$

$55^0 + 40^0 + \angle C = 180^0$

$95^0 + \angle C = 180^0$

$\angle C = 180^0 - 95^0$

$\angle C = 85^0$

Question 2: If the angles of a triangle are in the ratio 1:2:3, determine three angles.

Solution:
Angles of a triangle are in the ratio 1:2:3 (Given)

Let the angles be x, 2x, 3x

Sum of all angles of triangles = 180^0

$x + 2x + 3x = 180^0$

$6x = 180^0$

$x = 180^0/6$

$x = 30^0$

Answer:
$x = 30^0$

$2x = 2(30)^0 = 60^0$

$3x = 3(30)^0 = 90^0$

Question 3: The angles of a triangle are $(x - 40)^0$, $(x - 20)^0$ and $(1/2\ x - 10)^0$. Find the value of x.

Solution:

The angles of a triangle are $(x - 40)^0$, $(x - 20)^0$ and $(1/2\ x - 10)^0$

Sum of all angles of triangle = 180^0

$(x - 40)^0 + (x - 20)^0 + (1/2\ x - 10)^0 = 180^0$

$5/2\ x - 70^0 = 1800$

$5/2\ x = 180^0 + 70^0$

$5x = 2(250)^0$

$x = 500^0/5$

$x = 100^0$

Question 4: The angles of a triangle are arranged in ascending order of magnitude. If the difference between two consecutive angles is 10^0, find the three angles.

Solution:

The difference between two consecutive angles is 10^0 (given)

Let x, $x + 10^0$, $x + 20^0$ be the consecutive angles

$x + x + 10^0 + x + 20^0 = 180^0$

$3x + 30^0 = 180^0$

$3x = 180^0 - 30^0$

$3x = 150^0$

or $x = 50^0$

Again,
$x + 10^0 = 50^0 + 10^0 = 60^0$
$x+20^0 = 50^0 + 20^0 = 70^0$

Answer: Three angles are 50^0,60^0 and 70^0.

Question 5: Two angles of a triangle are equal and the third angle is greater than each of those angles by 30^0. Determine all the angles of the triangle.

Solution:

Two angles of a triangle are equal and the third angle is greater than each of those angles by 30^0. (Given)

Let x, x, $x + 30^0$ be the angles of a triangle.

Sum of all angles in a triangle = 180^0

$x + x + x + 30^0 = 180^0$

$3x + 30^0 = 180^0$

$3x = 150^0$

or $x = 50^0$

And $x + 30^0 = 50^0 + 30^0 = 80^0$

Answer: Three angles are 50^0, 50^0 and 80^0.

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

Solution:

One angle of a triangle is equal to the sum of the other two angles (given)

To Prove: One of the angles is 90^0

Let x, y and z are three angles of a triangle, where

$z = x + y$ …(1)

Sum of all angles of a triangle = 180^0

$x + y + z = 180^0$

$z + z = 180^0$ (Using equation (1))

$2z = 180^0$
$z = 90^0$ (Proved)

Therefore, triangle is a right angled triangle.