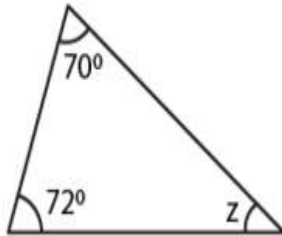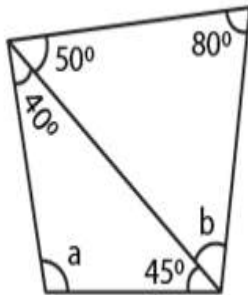EXERCISE 26(A)

1. In each of the following, find the marked unknown angles:
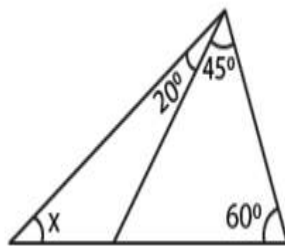
(i)

(ii)

(iii)

Solution:

(i) We know that,

Sum of all angles of triangle $= 180^0$

Therefore,

$70^0 + 72^0 + z = 180^0$

$142^0 + z = 180^0$

$z = 180^0 - 142^0$

We get,

$z = 38^0$

(ii) We know that,

Sum of all angles of a triangle $= 180^0$

First triangle

$50^0 + 80^0 + b = 180^0$

$130^0 + b = 180^0$

$b = 180^0 - 130^0$

We get,

b = 50^0
Second triangle
$40^0 + 45^0 + a = 180^0$
$85^0 + a = 180^0$
$a = 180^0 - 85^0$
We get,
$a = 95^0$
(iii) $60^0 + 45^0 + 20^0 + x = 180^0$
$125^0 + x = 180^0$
$x = 180^0 - 125^0$
We get,
$x = 55^0$

2. Can a triangle together have the following angles?
(i) 55^0, 55^0 and 80^0
(ii) 33^0, 74^0 and 73^0
(iii) 85^0, 95^0 and 22^0
Solution:
(i) Sum of all angles of a triangle = 180^0
Here,
$55^0 + 55^0 + 80^0 = 180^0$
We get,
$190^0 \neq 180^0$
Therefore, it cannot form a triangle
(ii) $33^0 + 74^0 + 73^0 = 180^0$
We get,
$180^0 = 180^0$
Therefore, it form a triangle
(iii) $85^0 + 95^0 + 22^0 = 180^0$
We get,
$202^0 \neq 180^0$
Therefore, it cannot form a triangle

3. Find x, if the angles of a triangle are:
(i) x^0, x^0, x^0
(ii) x^0, $2x^0$, $2x^0$
(iii) $2x^0$, $4x^0$, $6x^0$
Solution:
We know that,

The sum of all the angles in a triangle is 180^0
So,
$x^0 + x^0 + x^0 = 180^0$
$3x = 180^0$
$x = 180^0 / 3$
We get,
$x = 60^0$
The value of $x = 60^0$
(ii) We know that,
The sum of all the angles in a triangle is 180^0
So,
$x + 2x + 2x = 180^0$
$5x = 180^0$
$x = 180^0 / 5$
We get,
$x = 36^0$
Therefore, the value of $x = 36^0$
(iii) We know that,
The sum of all the angles in a triangle is 180^0
So,
$2x + 4x + 6x = 180^0$
$12x = 180^0$
$x = 180^0 / 12$
We get,
$x = 15^0$
Therefore, the value of $x = 15^0$

4. One angle of a right-angled triangle is 70^0. Find the other acute angle.
Solution:
We know that,
Sum of all the angles in a triangle = 180^0
Let us consider the acute angle as x
Hence,
$x + 90^0 + 70^0 = 180^0$
$x + 160^0 = 180^0$
$x = 180^0 - 160^0$
We get,
$x = 20^0$
Therefore, the acute angle is 20^0

5. In △ABC, ∠A = ∠B = 62⁰; find ∠C
Solution:
Given
∠A = ∠B = 62⁰
So,
∠A + ∠B + ∠C = 180⁰
62⁰ + 62⁰ + ∠C = 180⁰
124⁰ + ∠C = 180⁰
∠C = 180⁰ - 124⁰
We get,
∠C = 56⁰
Hence, ∠C = 56⁰

6. In △ABC, ∠B = ∠C and ∠A = 100⁰; find ∠B.
Solution:
Given
∠B = ∠C
We know that,
Sum of all the angles in a triangle is 180⁰
∠A + ∠B + ∠C = 180⁰
100⁰ + ∠B + ∠B = 180⁰
100⁰ + 2∠B = 180⁰
2∠B = 180⁰ – 100⁰
We get,
2∠B = 80⁰
∠B = 80⁰ / 2
∠B = 40⁰
Therefore, ∠B + ∠C = 40⁰

7. Find, giving reasons, the unknown marked angles, in each triangle drawn below:

(i)

(ii)

(iii)
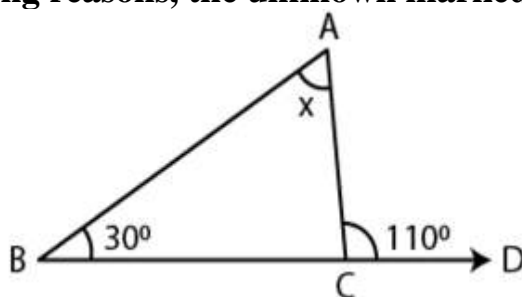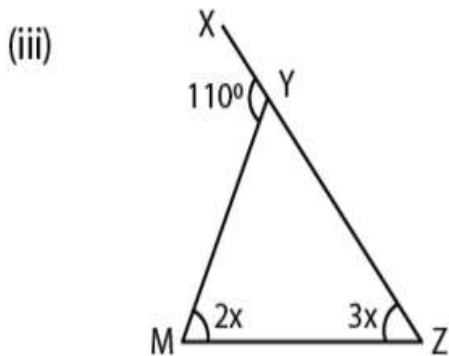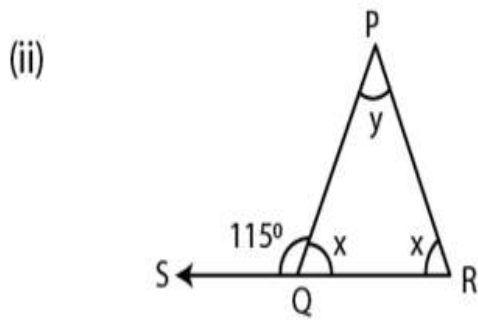
Solution:

We know that,

Exterior angle of a triangle is always equal to the sum of its two interior opposite angles (property)

So,

(i) $110^0 = x + 30^0$ [By property]

$x = 110^0 - 30^0$

We get,

$x = 80^0$

(ii) $x + 115^0 = 180^0$ [By linear property of angles]

$x = 180^0 - 115^0$

We get,

$x = 65^0$

By exterior angle property

$x + y = 115^0$

$65^0 + y = 115^0$

$y = 115^0 - 65^0$

We get,

$y = 50^0$

Therefore the value of angle x is 65^0 and y is 50^0

(iii) By exterior angle property,

$110^0 = 2x + 3x$

$5x = 110^0$
$x = 110^0 / 5$
We get,
$x = 22^0$
Hence,
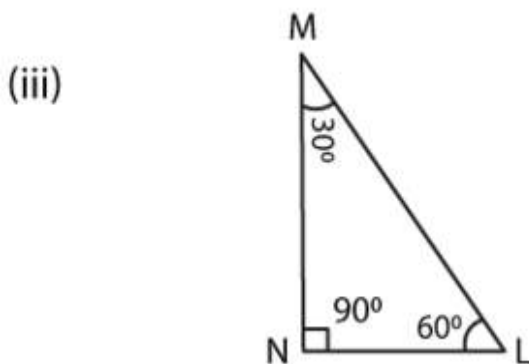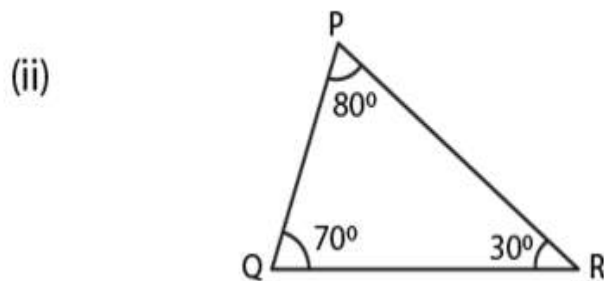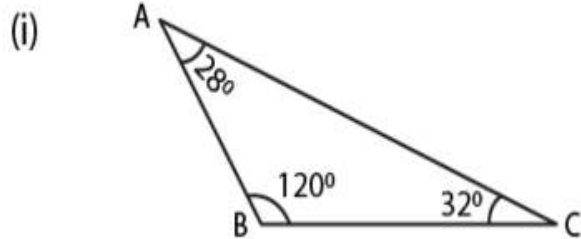The value of $2x = 2 \times 22$
$= 44^0$
The value of $3x = 3 \times 22$
$= 66^0$

8. Classify the following triangles according to angle:

(i)

(ii)

(iii)

Solution:
(i) Since, one of the angle of a triangle is 120^0.
Therefore, it is obtuse angled triangle

(ii) Since, all the angles of a triangle is less than 90^0
Therefore, it is acute angled triangle
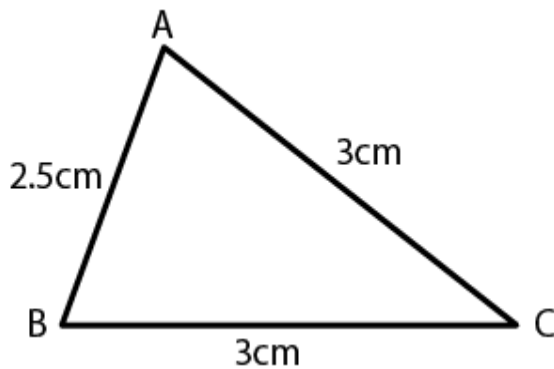(iii) Since $\angle MNL = 90^0$ and
Sum of two acute angle s,
$\angle M + \angle N = 30^0 + 60^0$
$= 90^0$
Therefore, it is right angled triangle
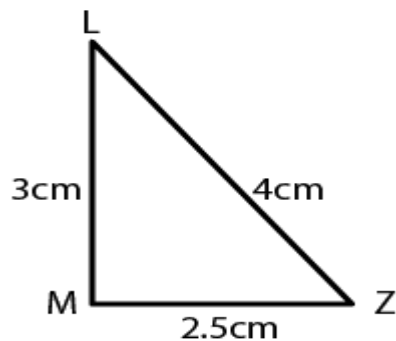
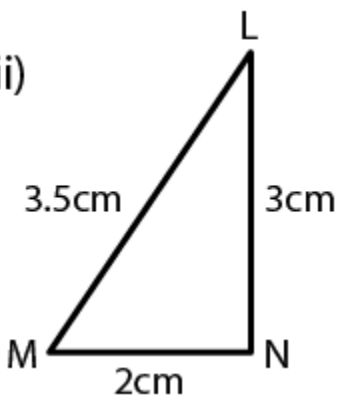**9. Classify the following triangles according to sides:**
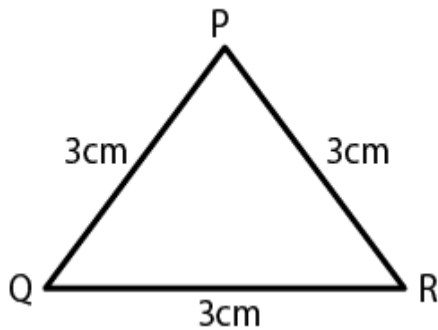**(i)**

(ii)

(iii)

(iv)

Solution:

(i) In the given triangle, we find two sides are equal.

Therefore, it is isosceles triangle

(ii) In the given triangle, all the three sides are unequal.

Therefore, it is scalene triangle

(iii) In the given triangle, all the three sides are unequal.

Therefore, it is scalene triangle

(iv) In the given triangle, all the three sides are equal.

Therefore, it is equilateral triangle