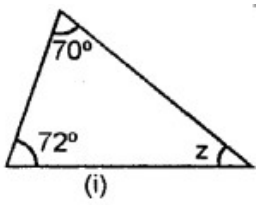
Triangle

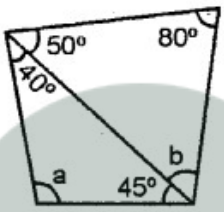
EXERCISE 26 (A)

Question 1.

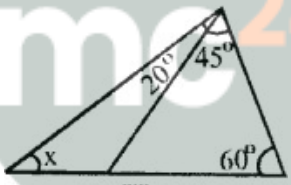
In each of the following, find the marked unknown angles :



(i)



(ii)



(iii)

Solution:

(i) Since, sum of all angles of triangle = 180°

Hence, 70° + 72° + z = 180°

⇒ 142°+ z = 180° ”

⇒ z= 180°-142°

z = 38°

(ii) Since, sum of all angles of a triangle = 180°

1st Triangle 50° + 80° + b = 180°

⇒ 130°+ &= 180°

⇒b= 180° – 130°

b = 50°

IInd Triangle 40° + 45° + a = 180°

⇒ 85° + a = 180°

⇒ a = 180° -85

a = 95°

(iii) 60° + 45° + 20° + x = 180°

⇒ 125° + x = 180°

⇒ x = 180° – 125° => x = 55°

Question 2.

Can a triangle together have the following angles ?

(i) 55°, 55° and 80°

(ii) 33°, 74° and 73°

(iii) 85°, 95° and 22°.

Solution:

(i) Sum of all angles of a triangle = 180° Here, 55° + 55° + 80° = 180°

190° ≠ 180°

No.

(ii) 33°+ 74°+ 73°= 180°

180°= 180°

Yes.

(iii) 85° + 95° + 22° = 180°

202° ≠ 180°

No.

Question 3.

Find x, if the angles of a triangle are:

(i) x°, x°, x°

(ii) x°, 2x°, 2x°

(iii) 2x°, 4x°, 6x°

Solution:

(i) Since, sum of all the angles of a triangle =180

x° + x° + x° = 180

⇒ 3x° = 180

⇒ $x° = \frac{180}{3}$

x = 60

(ii) x° + 2x° + 2x° = 180

5x° = 180

$x° = \frac{180}{5}$

x° = 36

(iii) 2x° + 4x° + 6x° =180

12x° = 180

$x° = \frac{180}{12}$

x° = 15

Question 4.

One angle of a right-angled triangle is 70°. Find the other acute angle.

Solution:

We know that, sum of angles of a triangle = 180°.

Let, the acute angle be 'x'

∴ x + 90° + 70° = 180°

⇒ x+ 160° = 180°

⇒ x= 180°-160°

⇒ x = 20°

∴The acute angle is 20°.

Question 5.

In ∆ABC, ∠A = ∠B = 62° ; find ∠C.

Solution:

∠A + ∠B + ∠C= 180°

⇒ 62° + 62° + ∠C = 180°

⇒ 124° + ∠C = 180°

⇒ ∠C = 180° – 124°

⇒∠C = 56°

Question 6.

In ∆ABC, C = 56°C = 56° ∠B = ∠C and ∠A = 100° ; find ∠B.

Solution:

∠A + ∠B + ∠C = 180°

⇒ 100° + ∠B + ∠B = 180°

⇒ 2∠B = 180° 100°

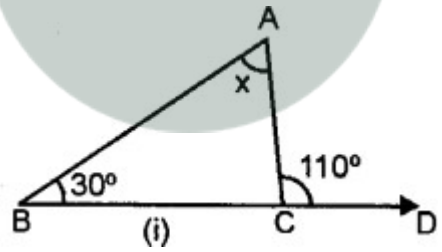
$\angle B = \frac{80}{2}°$

∠B = 40°

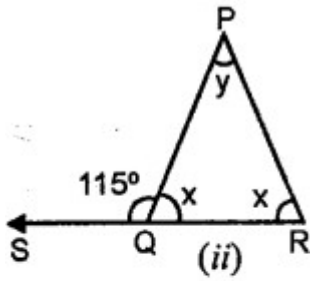
∠C = ∠B = 40°

Question 7.

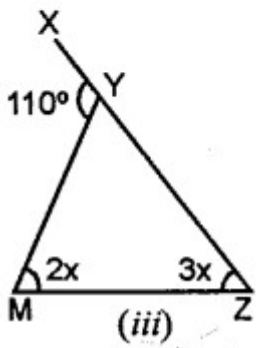
Find, giving reasons, the unknown marked angles, in each triangle drawn below:



(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)

(i) ∴ 110° = x + 30° (by property)

⇒x=110°-30° x = 80°

(ii) x+115° = 180°

(linear property of angles)

⇒x = 180°- 115° ⇒x = 65°

∴115° = x + y

⇒ 115° = 65° + _y ⇒ y= 115° – 65° =50°

y = 50°

(iii) 110° = 2x + 3x

5x – 110°

$x = \frac{110}{5}°$

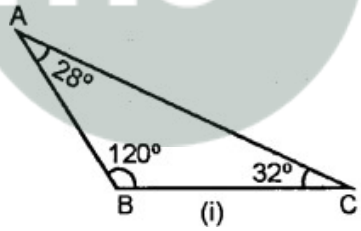
x = 22°

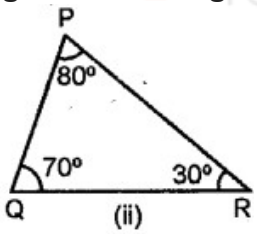
∴2x = 2 x 22 = 44°

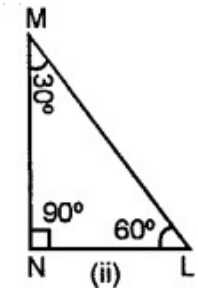
3x = 3 x 22 = 66°

Question 8.

Classify the following triangles according to angle :







Solution:

(i) Since, it has an obtuse angle of 120° Hence, it is obtuse angled triangle.

(ii) Since, all the angle of triangle is less than 90°.

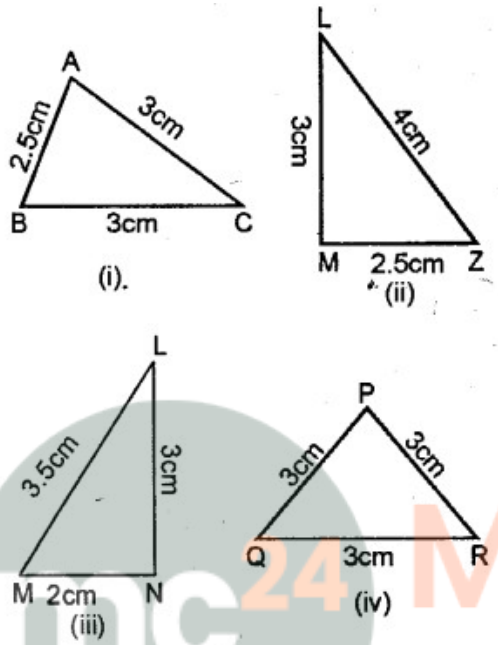
Hence, it is an acute angled triangle.

(iii) Since ∠MNL = 90°, and sum of two acute angle ∠M + ∠N = 30° + 60° = 90°.

Hence, it is a right angled triangle.

Question 9.

Classify the following triangles according to sides :



Solution:

(i) Since, two sides-are equal.
Hence, Isosceles triangle.
(ii) Since, all the three sides are unequal.
Hence, Scalene, triangle.
(iii) Since, all the three sides are unequal Hence, Scalene triangle.
(iv) All the three sides are equal.
Hence, equilateral triangle.