Mathematics

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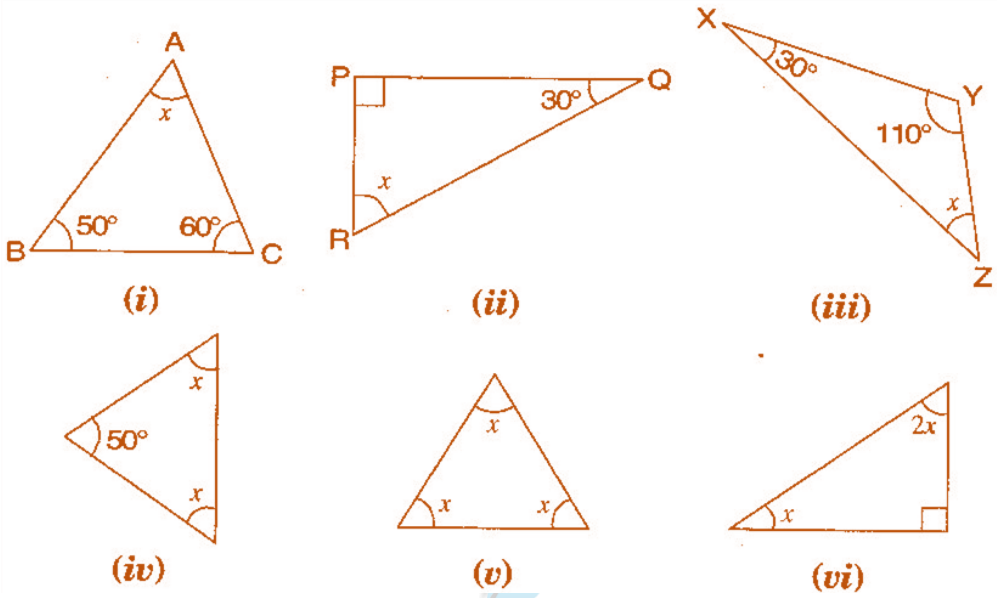
(Chapter – 6) (The Triangle and its Properties)

(Class – VII)

Exercise 6.3

Question 1:

Find the value of unknown x in the following diagrams:



Answer 1:

(i) In ΔABC,

$\angle BAC + \angle ACB + \angle ABC = 180°$ [By angle sum property of a triangle]

$\Rightarrow \quad x + 50° + 60° = 180°$

$\Rightarrow \quad x + 110° = 180°$

$\Rightarrow \quad x = 180° - 110° = 70°$

(ii) In ΔPQR,

$\angle RPQ + \angle PQR + \angle RPQ = 180°$ [By angle sum property of a triangle]

$\Rightarrow \quad 90^\circ + 30^\circ + x = 180°$

$\Rightarrow \quad x + 120° = 180°$

$\Rightarrow \quad x = 180° - 120° = 60°$

(iii) In ΔXYZ,

$\angle ZXY + \angle XYZ + \angle YZX = 180°$ [By angle sum property of a triangle]

$\Rightarrow \quad 30^\circ + 110^\circ + x = 180°$

$\Rightarrow \quad x + 140° = 180°$

$\Rightarrow \quad x = 180° - 140° = 40°$

(iv) In the given isosceles triangle,

$x+x+50°=180°$ [By angle sum property of a triangle]

$\Rightarrow \quad 2x+50°=180°$

$\Rightarrow \quad 2x=180°-50°$

$\Rightarrow \quad 2x=130°$

$\Rightarrow \quad x=\frac{130°}{2}=65°$

(v) In the given equilateral triangle,

$x+x+x=180°$ [By angle sum property of a triangle]

$\Rightarrow \quad 3x=180°$

$\Rightarrow \quad x=\frac{180°}{3}=60°$

(vi) In the given right angled triangle,

$x+2x+90°=180°$ [By angle sum property of a triangle]

$\Rightarrow \quad 3x+90°=180°$

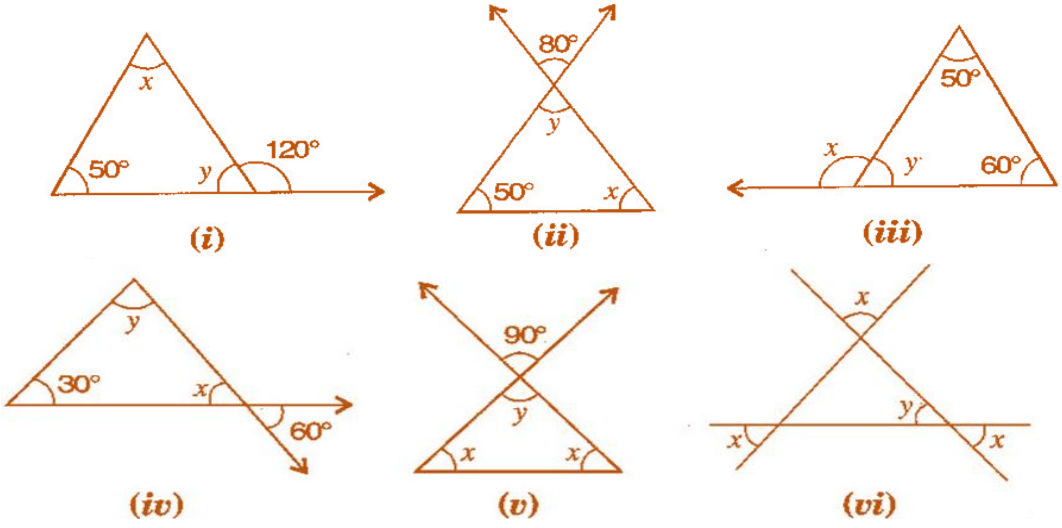
$\Rightarrow \quad 3x=180°-90°$

$\Rightarrow \quad 3x=90°$

$\Rightarrow \quad x=\frac{90°}{3}=30°$

Question 2:

Find the values of the unknowns x and y in the following diagrams:



Answer 2:

(i) $50° + x = 120°$ [Exterior angle property of a Δ]

$\Rightarrow \quad x = 120° - 50° = 70°$

Now, $50° + x + y = 180°$ [Angle sum property of a Δ]

$\Rightarrow \quad 50° + 70° + y = 180°$

$\Rightarrow \quad 120° + y = 180°$

$\Rightarrow \quad y = 180° - 120° = 60°$

(ii) $y = 80°$ .....(i) [Vertically opposite angle]

Now, $50° + x + y = 180°$ [Angle sum property of a Δ]

$\Rightarrow \quad 50° + 80° + y = 180°$ [From equation (i)]

$\Rightarrow \quad 130° + y = 180°$

$\Rightarrow \quad y = 180° - 130° = 50°$

(iii) $50° + 60° = x$ [Exterior angle property of a Δ]

$\Rightarrow \quad x = 110°$

Now $50° + 60° + y = 180°$ [Angle sum property of a Δ]

$\Rightarrow \quad 110° + y = 180°$

$\Rightarrow \quad y = 180° - 110°$

$\Rightarrow \quad y = 70°$

(iv) $x = 60^\circ$ .....(i) [Vertically opposite angle]

Now, $30° + x + y = 180°$ [Angle sum property of a Δ]

$\Rightarrow \quad 50° + 60° + y = 180°$ [From equation (i)]

$\Rightarrow \quad 90° + y = 180°$

$\Rightarrow \quad y = 180° - 90° = 90°$

(v) $y = 90^\circ$ .....(i) [Vertically opposite angle]

Now, $y + x + x = 180°$ [Angle sum property of a Δ]

$\Rightarrow \quad 90° + 2x = 180°$ [From equation (i)]

$\Rightarrow \quad 2x = 180° - 90°$

$\Rightarrow \quad 2x = 90°$

$\Rightarrow \quad x = \frac{90^\circ}{2} = 45^\circ$

(vi) $x = y$ .....(i) [Vertically opposite angle]

Now, $x + x + y = 180°$ [Angle sum property of a Δ]

$\Rightarrow$ $2x + x = 180°$ [From equation (i)]

$\Rightarrow$ $3x = 180°$

$\Rightarrow$ $x = \frac{180°}{3} = 60°$