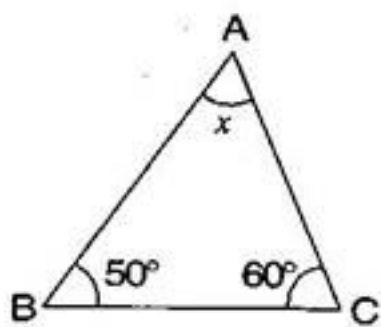


CBSE Class –VII Mathematics

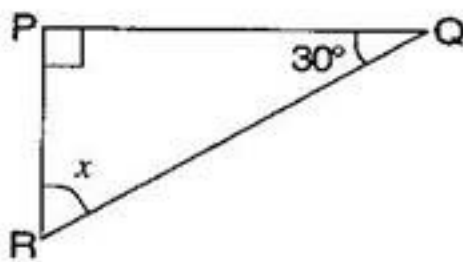
NCERT Solutions

Chapter 6 The Triangle and its Properties (Ex. 6.3)

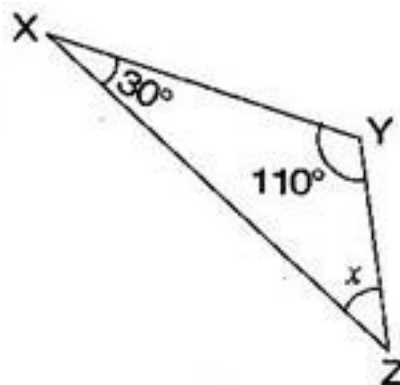
Question 1. Find the value of unknown x in the following diagrams:



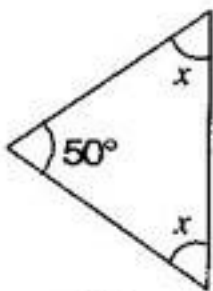
(i)



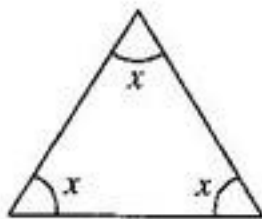
(ii)



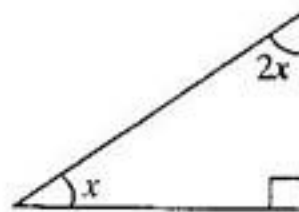
(iii)



(iv)



(v)



(vi)

Answer: (i) In $\triangle ABC$,

$$\angle BAC + \angle ABC + \angle ACB = 180^\circ \text{ [By angle sum property of a triangle]}$$

$$\Rightarrow x + 50^\circ + 60^\circ = 180^\circ$$

$$\Rightarrow x + 110^\circ = 180^\circ \Rightarrow x = 180^\circ - 110^\circ = 70^\circ$$

(ii) In $\triangle PQR$,

$$\angle RPQ + \angle PQR + \angle RPQ = 180^\circ \text{ [By angle sum property of a triangle]}$$

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

$$\Rightarrow x + 120^\circ = 180^\circ \Rightarrow x = 180^\circ - 120^\circ = 60^\circ$$

(iii) In $\triangle XYZ$,

$$\angle ZXY + \angle XYZ + \angle YZX = 180^\circ \text{ [By angle sum property of a triangle]}$$

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

$$\Rightarrow x + 140^\circ = 180^\circ \Rightarrow x = 180^\circ - 140^\circ = 40^\circ$$

(iv) In the given isosceles triangle,

$$x + x + 50^\circ = 180^\circ \text{ [By angle sum property of a triangle]}$$

$$\Rightarrow 2x + 50^\circ = 180^\circ$$

$$\Rightarrow 2x = 180^\circ - 50^\circ \Rightarrow 2x = 130^\circ$$

$$\Rightarrow x = \frac{130^\circ}{2} = 65^\circ$$

(v) In the given equilateral triangle,

$$x + x + x = 180^\circ \text{ [By angle sum property of a triangle]}$$

$$\Rightarrow 3x = 180^\circ$$

$$\Rightarrow x = \frac{180^\circ}{3} = 60^\circ$$

(vi) In the given right angled triangle,

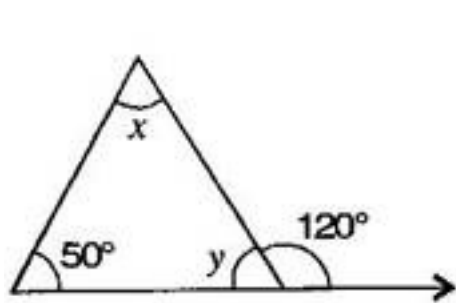
$$x + 2x + 90^\circ = 180^\circ \text{ [By angle sum property of a triangle]}$$

$$\Rightarrow 3x + 90^\circ = 180^\circ$$

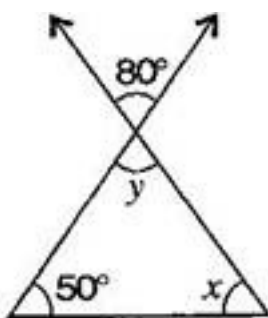
$$\Rightarrow 3x = 180^\circ - 90^\circ \Rightarrow 3x = 90^\circ$$

$$\Rightarrow x = \frac{90^\circ}{3} = 30^\circ$$

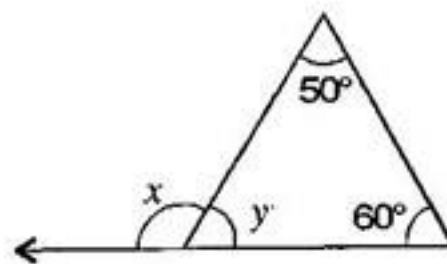
Question 2. Find the values of the unknowns x and y in the following diagrams:



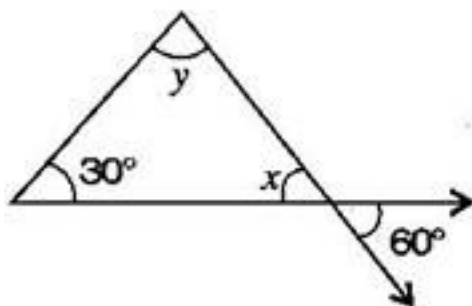
(i)



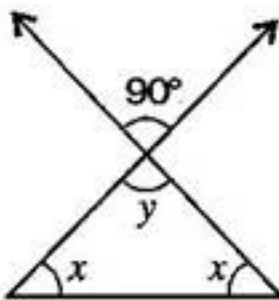
(ii)



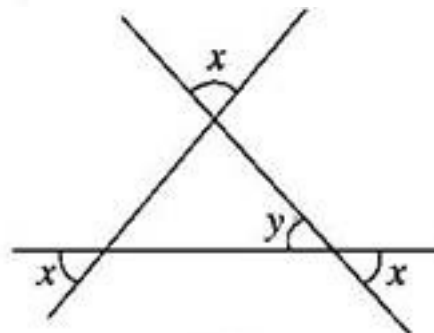
(iii)



(iv)



(v)



(vi)

Answer: (i) $50^\circ + x = 120^\circ$ [Exterior angle property of a Δ]

$$\Rightarrow x = 120^\circ - 50^\circ = 70^\circ$$

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

$$\Rightarrow 50^\circ + 70^\circ + y = 180^\circ$$

$$\Rightarrow 120^\circ + y = 180^\circ \Rightarrow y = 180^\circ - 120^\circ = 60^\circ$$

(ii) $y = 80^\circ$ (i) [Vertically opposite angle]

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

$$\Rightarrow 50^\circ + 80^\circ + x = 180^\circ$$

[From eq. (i)]

$$\Rightarrow 130^\circ + x = 180^\circ \Rightarrow x = 180^\circ - 130^\circ = 50^\circ$$

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

$$\Rightarrow x = 110^\circ$$

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

$$\Rightarrow 110^\circ + y = 180^\circ$$

$$\Rightarrow y = 180^\circ - 110^\circ \Rightarrow y = 70^\circ$$

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

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

$$\Rightarrow 30^\circ + 60^\circ + y = 180^\circ \text{ [From eq. (i)]}$$

$$\Rightarrow 90^\circ + y = 180^\circ \Rightarrow y = 180^\circ - 90^\circ = 90^\circ$$

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

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

$$\Rightarrow 90^\circ + 2x = 180^\circ \text{ [From eq. (i)]}$$

$$\Rightarrow 2x = 180^\circ - 90^\circ \Rightarrow 2x = 90^\circ$$

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

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

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

$$\Rightarrow 2x + x = 180^\circ \text{ [From eq. (i)]}$$

$$\Rightarrow 3x = 180^\circ \Rightarrow x = \frac{180^\circ}{3} = 60^\circ$$