



**SpeedLabs**

**MATHS**

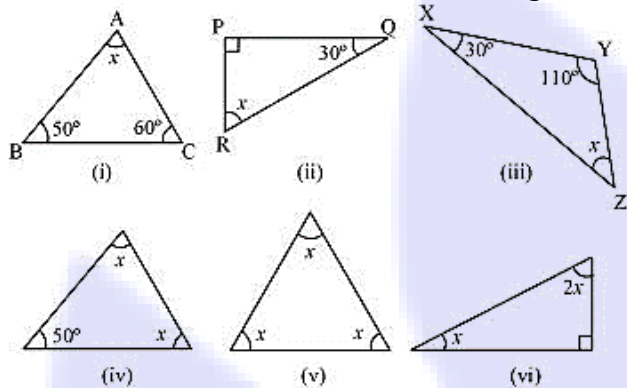
**CBSE 7<sup>th</sup>**

**TEEVRA EDUTECH PVT. LTD.**

# The Triangle and Its Properties

## Exercise-6.3

**Q.1** Find the value of the unknown exterior angle  $x$  in the following diagrams:



**Sol:** The sum of all interior angles of a triangle is  $180^\circ$ . By using this property, these problems can be solved as follows.

$$(i) x + 50^\circ + 60^\circ = 180^\circ$$

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

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

$$(ii) x + 90^\circ + 30^\circ = 180^\circ$$

$$x + 120^\circ = 180^\circ$$

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

$$(iii) x + 30^\circ + 110^\circ = 180^\circ$$

$$x + 140^\circ = 180^\circ$$

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

$$(iv) 50^\circ + x + x = 180^\circ$$

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

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

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

$$(v) x + x + x = 180^\circ$$

$$3x = 180^\circ$$

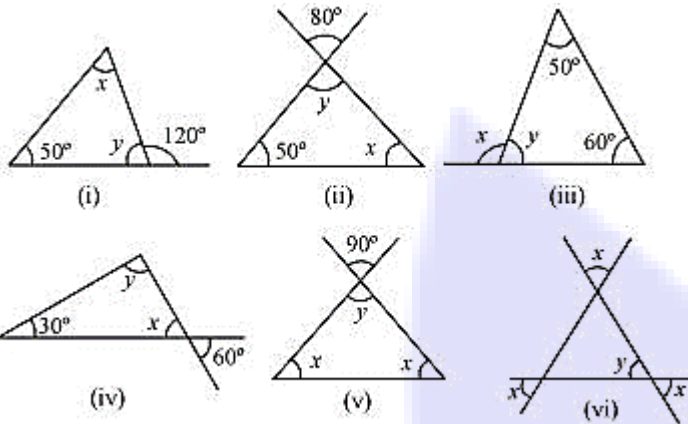
$$x = \frac{180^\circ}{3} = 60^\circ$$

$$(vi) x + 2x + 90^\circ = 180^\circ$$

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

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

**Q.2** Find the value of the unknowns  $x$  and  $y$  in the following diagrams:



**Sol:** (i)  $y + 120^\circ = 180^\circ$  (Linear pair)

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

$$x + y + 50^\circ = 180^\circ \text{ (Angle sum property)}$$

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

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

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

(ii)  $y = 80^\circ$  (Vertically opposite angles)

$$y + x + 50^\circ = 180^\circ \text{ (Angle sum property)}$$

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

$$x + 130^\circ = 180^\circ$$

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

(iii)  $y + 50^\circ + 60^\circ = 180^\circ$  (Angle sum property)

$$y = 180^\circ - 60^\circ - 50^\circ = 70^\circ$$

$$x + y = 180^\circ \text{ (Linear pair)}$$

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

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

(iv)  $x = 60^\circ$  (Vertically opposite angles)

$$30^\circ + x + y = 180^\circ$$

$$30^\circ + 60^\circ + y = 180^\circ$$

$$y = 180^\circ - 30^\circ - 60^\circ = 90^\circ$$

(v)  $y = 90^\circ$  (Vertically opposite angles)

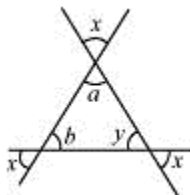
$$x + x + y = 180^\circ \text{ (Angle sum property)}$$

$$2x + y = 180^\circ$$

$$2x + 90^\circ = 180^\circ$$

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

(vi)



$y = x$  (Vertically opposite angles)

$a = x$  (Vertically opposite angles)

$b = x$  (Vertically opposite angles)

$a + b + y = 180^\circ$  (Angle sum property)

$x + x + x = 180^\circ$

$3x = 180^\circ$

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

$y = x = 60^\circ$