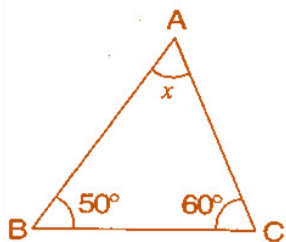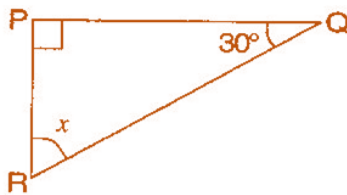# *Exercise 6.3*

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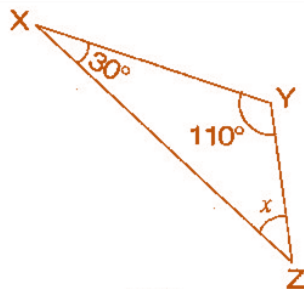
Find the value of unknown x in the following diagrams:
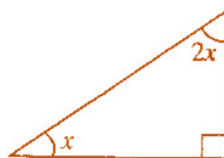

(i)   (ii)   (iii)

(iv)   (v)   (vi)

Answer 1:

(i)   In $\triangle ABC$,
        $\angle BAC + \angle ACB + \angle ABC = 180°$ [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 $\triangle PQR$,
        $\angle RPQ + \angle PQR + \angle RPQ = 180°$ [By angle sum property of a triangle]
        $\Rightarrow \quad 90° + 30° + x = 180°$
        $\Rightarrow \quad x + 120° = 180°$
        $\Rightarrow \quad x = 180° - 120° = 60°$

(iii)   In $\triangle XYZ$,
        $\angle ZXY + \angle XYZ + \angle YZX = 180°$ [By angle sum property of a triangle]
        $\Rightarrow \quad 30° + 110° + x = 180°$
        $\Rightarrow \quad x + 140° = 180°$
        $\Rightarrow \quad x = 180° - 140° = 40°$
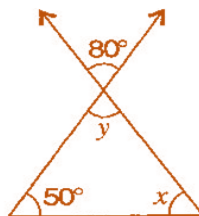
(iv)   In the given isosceles triangle,

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

$\Rightarrow \qquad 2x + 50° = 180°$

$\Rightarrow \qquad 2x = 180° - 50°$

$\Rightarrow \qquad 2x = 130°$

$\Rightarrow \qquad x = \dfrac{130°}{2} = 65°$

(v)   In the given equilateral triangle,

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

$\Rightarrow \qquad 3x = 180°$

$\Rightarrow \qquad x = \dfrac{180°}{3} = 60°$

(vi)   In the given right angled triangle,

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

$\Rightarrow \qquad 3x + 90° = 180°$

$\Rightarrow \qquad 3x = 180° - 90°$

$\Rightarrow \qquad 3x = 90°$

$\Rightarrow \qquad x = \dfrac{90°}{3} = 30°$

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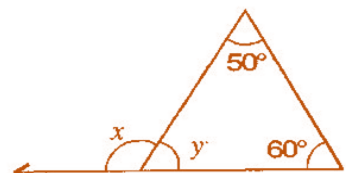
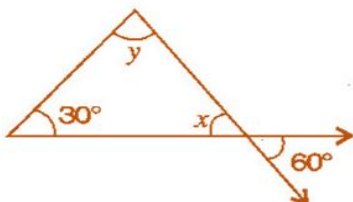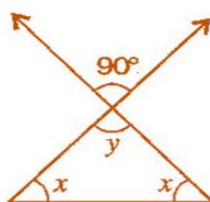Find the values of the unknowns x and y in the following diagrams:

Answer 2:
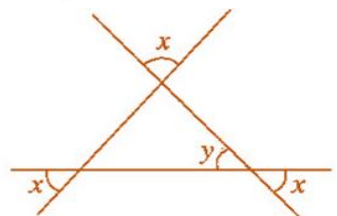
(i) $50° + x = 120°$ [Exterior angle property of a Δ]

$\Rightarrow$ $x = 120° - 50° = 70°$

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

$\Rightarrow$ $50° + 70° + y = 180°$

$\Rightarrow$ $120° + y = 180°$

$\Rightarrow$ $y = 180° - 120° = 60°$

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

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

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

$\Rightarrow$ $130° + y = 180°$

$\Rightarrow$ $y = 180° - 130° = 50°$

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

$\Rightarrow$ $x = 110°$

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

$\Rightarrow$ $110° + y = 180°$

$\Rightarrow$ $y = 180° - 110°$

$\Rightarrow$ $y = 70°$

(iv) $x = 60°$ ....(i)   [Vertically opposite angle]

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

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

$\Rightarrow$ $90° + y = 180°$

$\Rightarrow$ $y = 180° - 90° = 90°$

(v) $y = 90°$ ....(i)   [Vertically opposite angle]

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

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

$\Rightarrow$ $2x = 180° - 90°$

$\Rightarrow$ $2x = 90°$

$\Rightarrow$ $x = \dfrac{90°}{2} = 45°$

(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)]

$\Rightarrow$ $3x = 180°$

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