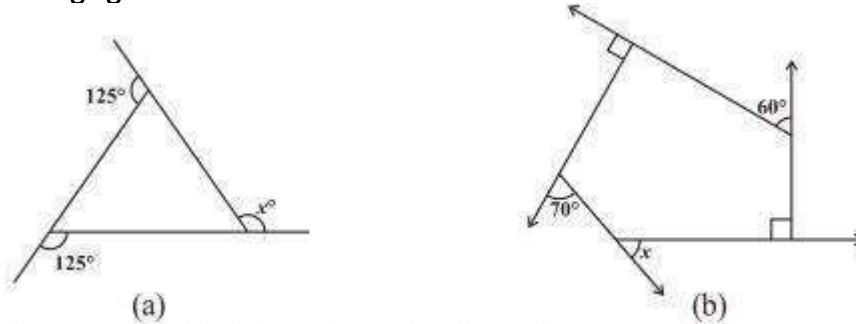


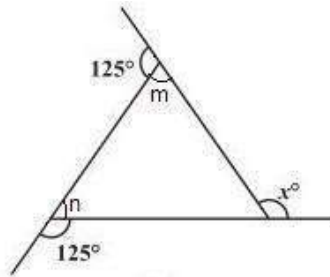
Exercise 3.2

1. Find  $x$  in the following figures.



Solution:

a)



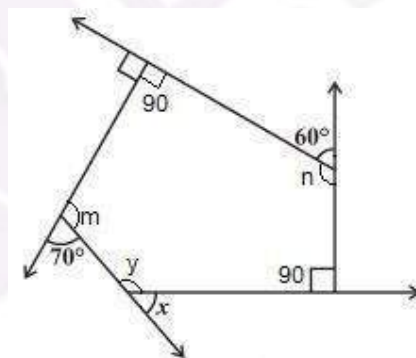
$$125^\circ + m = 180^\circ \Rightarrow m = 180^\circ - 125^\circ = 55^\circ \text{ (Linear pair)}$$

$$125^\circ + n = 180^\circ \Rightarrow n = 180^\circ - 125^\circ = 55^\circ \text{ (Linear pair)}$$

$$x = m + n \text{ (exterior angle of a triangle is equal to the sum of 2 opposite interior 2 angles)}$$

$$\Rightarrow x = 55^\circ + 55^\circ = 110^\circ$$

b)



Two interior angles are right angles =  $90^\circ$

$$70^\circ + m = 180^\circ \Rightarrow m = 180^\circ - 70^\circ = 110^\circ \text{ (Linear pair)}$$

$$60^\circ + n = 180^\circ \Rightarrow n = 180^\circ - 60^\circ = 120^\circ \text{ (Linear pair)}$$

The figure is having five sides and is a pentagon.

Thus, sum of the angles of pentagon =  $540^\circ$

$$90^\circ + 90^\circ + 110^\circ + 120^\circ + y = 540^\circ$$

$$\Rightarrow 410^\circ + y = 540^\circ \Rightarrow y = 540^\circ - 410^\circ = 130^\circ$$

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

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

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

## NCERT Solution For Class 8 Maths Chapter 3- Understanding Quadrilaterals

2. Find the measure of each exterior angle of a regular polygon of

- (i) 9 sides      (ii) 15 sides

**Solution:**

Sum of angles a regular polygon having side  $n = (n-2) \times 180^\circ$

(i) Sum of angles a regular polygon having side 9 =  $(9-2) \times 180^\circ = 7 \times 180^\circ = 1260^\circ$

Each interior angle =  $1260/9 = 140^\circ$

Each exterior angle =  $180^\circ - 140^\circ = 40^\circ$

Or,

Each exterior angle = sum of exterior angles/Number of angles =  $360/9 = 40^\circ$

(ii) Sum of angles a regular polygon having side 15 =  $(15-2) \times 180^\circ$

=  $13 \times 180^\circ = 2340^\circ$

Each interior angle =  $2340/15 = 156^\circ$

Each exterior angle =  $180^\circ - 156^\circ = 24^\circ$

Or,

Each exterior angle = sum of exterior angles/Number of angles =  $360/15 = 24^\circ$

3. How many sides does a regular polygon have if the measure of an exterior angle is  $24^\circ$ ?

**Solution:**

Each exterior angle = sum of exterior angles/Number of angles

$24^\circ = 360/\text{Number of sides}$

$\Rightarrow \text{Number of sides} = 360/24 = 15$

Thus, the regular polygon has 15 sides.

4. How many sides does a regular polygon have if each of its interior angles is  $165^\circ$ ?

**Solution:**

Interior angle =  $165^\circ$

Exterior angle =  $180^\circ - 165^\circ = 15^\circ$

Number of sides = sum of exterior angles/ exterior angles

$\Rightarrow \text{Number of sides} = 360/15 = 24$

Thus, the regular polygon has 24 sides.

5.

a) Is it possible to have a regular polygon with measure of each exterior angle as  $22^\circ$ ?

b) Can it be an interior angle of a regular polygon? Why?

**Solution:**

a) Exterior angle =  $22^\circ$

Number of sides = sum of exterior angles/ exterior angle

$\Rightarrow \text{Number of sides} = 360/22 = 16.36$

No, we can't have a regular polygon with each exterior angle as  $22^\circ$  as it is not divisor of 360.

b) Interior angle =  $22^\circ$

Exterior angle =  $180^\circ - 22^\circ = 158^\circ$

No, we can't have a regular polygon with each exterior angle as  $158^\circ$  as it is not divisor of 360.

6.

a) What is the minimum interior angle possible for a regular polygon? Why?

## NCERT Solution For Class 8 Maths Chapter 3- Understanding Quadrilaterals

b) What is the maximum exterior angle possible for a regular polygon?

Solution:

a) Equilateral triangle is regular polygon with 3 sides has the least possible minimum interior angle because the regular with minimum sides can be constructed with 3 sides at least. Since, sum of interior angles of a triangle =  $180^\circ$   
Each interior angle =  $180/3 = 60^\circ$

b) Equilateral triangle is regular polygon with 3 sides has the maximum exterior angle because the regular polygon with least number of sides have the maximum exterior angle possible. Maximum exterior possible =  $180 - 60^\circ = 120^\circ$

