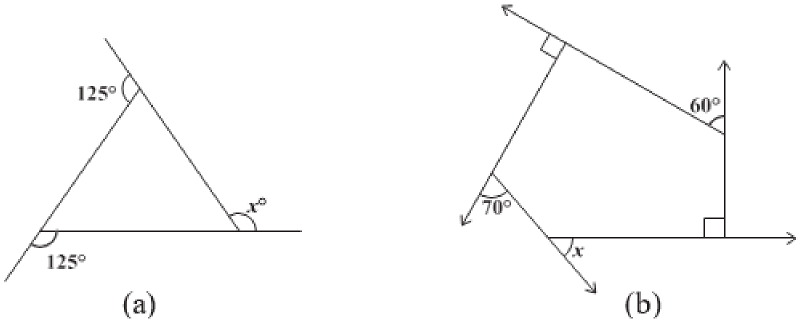
CLASS NOTES-ANSWERS

EXERCISE 3.2

1. Find x in the following figures.



Answer:

(a) Sum of the measures of the external angles is 360°

$125° + 125° + x° = 360°$

$250° + x = 360°$

$x = 360 - 250$

$x = 110°$

(b) Sum of the measures of the external angles is 360°

$60° + 90° + 70° + x + y = 360°$

$60° + 90° + 70° + x + 90° = 360°$

$310° + x = 360°$

$x = 50°$

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

(i) 9 sides (ii) 15 sides

Answer: Each exterior angle = $\frac{\text{Sum of Exterior angles}}{\text{Number of sides}}$

Total measure of all exterior angles $= 360°$

(i) 9 sides

Each exterior angle = $\frac{360}{9}$ = 40°

(ii) 15 sides

Each exterior angle = $\frac{360}{15}$ = 24°

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

Answer: Number of sides = $\frac{\text{Sum of Exterior angles}}{\text{Each exterior angle}}$

Total measure of all the exterior angles of the regular polygon = 360°

Measure of each exterior angle = 24°

Number of sides = $\frac{360}{24}$ = 15

Regular polygon has 15 sides.

4. How many sides does a regular polygon have if each of its interior angles is 165°?

Answer:

Measure of each interior angle = 165°

Measure of each exterior angle = 180° – 165° = 15° (linear pair)

Number of sides = $\frac{360}{15}$ = 24

Hence, the regular polygon has 24 sides.

5. (a) Is it possible to have a regular polygon with measure of each exterior angle as 22°?

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

Answer:

(a) Total measure of all exterior angles = 360°

Measure of each exterior angle = 22°

Therefore, the number of sides = $\frac{\text{Sum of Exterior angles}}{\text{Each exterior angle}}$

$$= \frac{360}{22}$$

$$= 16.36$$

We cannot have regular polygon with each exterior angle = 22° as the number of sides is not a whole number. [22 is not a perfect divisor of 360°]

(b) Measure of each interior angle = 22°

Measure of each exterior angle $= 180^\circ - 22^\circ = 158^\circ$

Therefore, the number of sides = $\frac{\text{Sum of Exterior angles}}{\text{Each exterior angle}}$

$$= \frac{360}{158}$$

$$= 2.27$$

We cannot have regular polygon with each interior angle as 22° because the number of sides is not a whole number. [22 is not a perfect divisor of 360°]

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

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

Answer:

(a) Consider a regular polygon having the least number of sides (i.e., an equilateral triangle).

Sum of all the angles of a triangle = 180°

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

$3x = 180°$

$x = 60°$

Thus, minimum interior angle possible for a regular polygon $= 60°$

(b) The exterior angle and an interior angle will always form a linear pair.

Thus, exterior angle will be maximum when interior angle is minimum.

Exterior angle $= 180° - 60° = 120°$

Therefore, maximum exterior angle possible for a regular polygon is 120°.

Equilateral triangle is a regular polygon having maximum exterior angle because it consists of least number of sides.