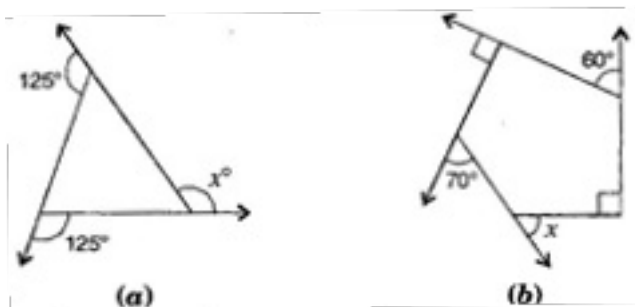


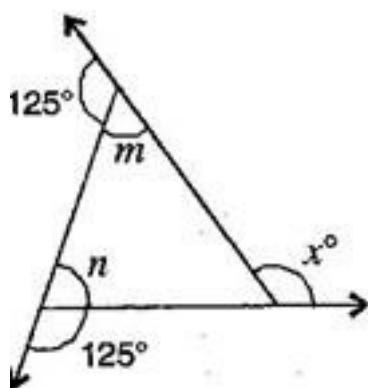
**CBSE Class –VIII Mathematics**  
**NCERT Solutions**  
**CHAPTER - 3**  
**Understanding Quadrilaterals (Ex. 3.2)**

1. Find  $x$  in the following figures:



**Ans.** (a) Here,  $125^\circ + m = 180^\circ$

[Linear pair]



$$\Rightarrow m = 180^\circ - 125^\circ = 55^\circ$$

And  $125^\circ + n = 180^\circ$

[Linear pair]

$$\Rightarrow n = 180^\circ - 125^\circ = 55^\circ$$

$\therefore$  Exterior angle  $x^\circ =$  Sum of opposite interior angles

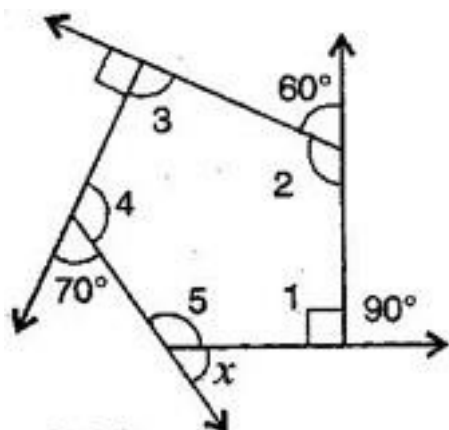
$$\therefore x^\circ = 55^\circ + 55^\circ = 110^\circ$$

(b) Sum of the angles of a pentagon

$$= (n-2) \times 180^\circ$$

$$= (5-2) \times 180^\circ$$

$$= 3 \times 180^\circ = 540^\circ$$



By linear pairs of angles,

$$\angle 1 + 90^\circ = 180^\circ \dots\dots\dots(\text{i})$$

$$\angle 2 + 60^\circ = 180^\circ \dots\dots\dots(\text{ii})$$

$$\angle 3 + 90^\circ = 180^\circ \dots\dots\dots(\text{iii})$$

$$\angle 4 + 70^\circ = 180^\circ \dots\dots\dots(\text{iv})$$

$$\angle 5 + x = 180^\circ \dots\dots\dots(\text{v})$$

Adding eq. (i), (ii), (iii), (iv) and (v),

$$x + (\angle 1 + \angle 2 + \angle 3 + \angle 4 + \angle 5) + 310^\circ = 900$$

$$\Rightarrow x + 540^\circ + 310^\circ = 900^\circ$$

$$\Rightarrow x + 850^\circ = 900^\circ$$

$$\Rightarrow x = 900^\circ - 850^\circ = 50^\circ$$

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

**(a) 9 sides**

**(b) 15 sides**

**Ans.** (i) Sum of angles of a regular polygon =  $(n-2) \times 180^\circ$

$$= (9-2) \times 180^\circ = 7 \times 180^\circ = 1260^\circ$$

$$\text{Each interior angle} = \frac{\text{Sum of interior angles}}{\text{Number of sides}} = \frac{1260^\circ}{9} = 140^\circ$$

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

(ii) Sum of exterior angles of a regular polygon =  $360^\circ$

$$\text{Each exterior angle} = 360/15$$

$$= 24 \text{ degrees}$$

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

**Ans.** Let number of sides be  $n$ .

Sum of exterior angles of a regular polygon =  $360^\circ$

$$\text{Number of sides} = \frac{\text{Sum of exterior angles}}{\text{Each exterior angle}} = \frac{360^\circ}{24^\circ} = 15$$

Hence, the regular polygon has 15 sides.

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

**Ans.** Let number of sides be  $n$ .

$$\text{Exterior angle} = 180^\circ - 165^\circ = 15^\circ$$

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Sum of exterior angles of a regular polygon =  $360^\circ$

$$\text{Number of sides} = \frac{\text{Sum of exterior angles}}{\text{Each interior angle}} = \frac{360^\circ}{15^\circ} = 24$$

Hence, the regular polygon has 24 sides.

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

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

**Ans.** (a) No. (Since 22 is not a divisor of  $360^\circ$ )

(b) No, (Because each exterior angle is  $180^\circ - 22^\circ = 158^\circ$ , which is not a divisor of  $360^\circ$ )

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**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?**

**Ans.** (a) The equilateral triangle being a regular polygon of 3 sides has the least measure of an

interior angle of  $60^\circ$ .

$\therefore$  Sum of all the angles of a triangle

$$= 180^\circ$$

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

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

$$\Rightarrow x = 60^\circ$$

(b) By (a), we can observe that the greatest exterior angle is  $180^\circ - 60^\circ$

$$= 120^\circ.$$