Exercise 11C

1. **(a)** Sum of interior angles of a 11-gon

$= (n - 2) \times 180°$

$= (11 - 2) \times 180°$

$= 1620°$

(b) Sum of interior angles of a 12-gon

$= (n - 2) \times 180°$

$= (12 - 2) \times 180°$

$= 1800°$

(c) Sum of interior angles of a 15-gon

$= (n - 2) \times 180°$

$= (15 - 2) \times 180°$

$= 2340°$

(d) Sum of interior angles of a 20-gon

$= (n - 2) \times 180°$

$= (20 - 2) \times 180°$

$= 3240°$

2. (a) Sum of interior angles of a quadrilateral

$= (n - 2) \times 180°$

$= (4 - 2) \times 180°$

$= 360°$

$78° + 62° + a° + 110° = 360°$

$a° = 360° - 78° - 62° - 110°$

$= 110°$

$\therefore a = 110$

(b) Sum of interior angles of a quadrilateral

$= (n - 2) \times 180°$

$= (4 - 2) \times 180°$

$= 360°$

$b° + 78° + 2b° + 84° = 360°$

$3b° = 360° - 78° - 84°$

$= 198°$

$b° = \frac{198°}{3}$

$= 66°$

$\therefore b = 66$

(c) Sum of interior angles of a pentagon

$= (n - 2) \times 180°$

$= (5 - 2) \times 180°$

$= 540°$

$c° + 152° + 38° + 2c° + 101° = 540°$

$3c° = 540° - 152° - 38° - 101°$

$3c° = 249°$

$c° = \frac{249°}{3}$

$= 83°$

$\therefore c = 83$

(d) Sum of interior angles of a hexagon

$= (n - 2) \times 180°$

$= (6 - 2) \times 180°$

$= 720°$

$102° + 5d° + 4d° + 4d° + 108° + 4d° = 720°$

$17d° = 720° - 102° - 108°$

$= 510°$

$d° = \frac{510°}{17}$

$= 30°$

$\therefore d = 30$

3. (a) (i) Sum of interior angles of a hexagon

$= (n - 2) \times 180°$

$= (6 - 2) \times 180°$

$= 720°$

(ii) Hence, size of each interior angle of a hexagon

$= \frac{720°}{6}$

$= 120°$

(b) (i) Sum of interior angles of a regular polygon with 18 sides

$= (n - 2) \times 180°$

$= (18 - 2) \times 180°$

$= 2880°$

(ii) Hence, size of each interior angle of a regular polygon with 18 sides

$= \frac{2880°}{18}$

$= 160°$

4. (a) The sum of exterior angles of the regular polygon is 360°.

∴ Size of each exterior angle of the regular polygon

$= \frac{360°}{24}$

$= 15°$

∴ Size of each interior angle of a regular polygon with 24 sides

$= 180° - 15°$

$= 165°$

(b) The sum of exterior angles of the regular polygon is 360°.

∴ Size of each exterior angle of the regular polygon

$= \frac{360°}{36}$

$= 10°$

∴ Size of each interior angle of a regular polygon with 36 sides

$= 180° - 10°$

$= 170°$

5. (a) The sum of exterior angles of the regular polygon is 360°.

∴ Number of sides of the polygon

$= \frac{360°}{90°}$

$= 4$

(b) The sum of exterior angles of the regular polygon is 360°.

∴ Number of sides of the polygon

$= \frac{360°}{45°}$

$= 8$

(c) The sum of exterior angles of the regular polygon is 360°.

∴ Number of sides of the polygon

$= \frac{360°}{12°}$

$= 30$

(d) The sum of exterior angles of the regular polygon is 360°.

∴ Number of sides of the polygon

$= \frac{360°}{4°}$

$= 90$

6. (a) Size of each interior angle of a regular polygon

$= 180° - 140°$

$= 40°$

The sum of exterior angles of the regular polygon is 360°.

∴ Number of sides of the polygon

$= \frac{360°}{40°}$

$= 9$

(b) Size of each interior angle of a regular polygon

$= 180° - 162°$

$= 18°$

The sum of exterior angles of the regular polygon is 360°

$\therefore$ Number of sides of the polygon

$= \frac{360°}{18°}$

$= 20$

(c) Size of each interior angle of a regular polygon

$= 180° - 172°$

$= 8°$

The sum of exterior angles of the regular polygon is 360°.

$\therefore$ Number of sides of the polygon

$= \frac{360°}{8°}$

$= 45$

(d) Size of each interior angle of a regular polygon

$= 180° - 175°$

$= 5°$

The sum of exterior angles of the regular polygon is 360°

$\therefore$ Number of sides of the polygon

$= \frac{360°}{5°}$

$= 72$

7. Sum of interior angles of a pentagon

$= (n - 2) \times 180°$

$= (5 - 2) \times 180°$

$= 540°$

$2x° + 3x° + 4x° + 5x° + 6x° = 540°$

$20x° = 540°$

$x° = \frac{540°}{20}$

$= 27°$

Hence, the largest interior angle of the pentagon

$= 6(27°)$

$= 162°$

8. (i) The sum of exterior angles of the triangle is 360°.

$3y° + 4y° + 5y° = 360°$

$12y° = 360°$

$y° = \frac{360°}{12}$

$= 30°$

$\therefore y = 30$

(ii) Smallest interior angle of the triangle

$= 180° - 5(30°)$

$= 180° - 150°$

$= 30°$

Practise Now 6

1. Sum of interior angles of a pentagon

$= (n - 2) \times 180°$

$= (5 - 2) \times 180°$

$= 540°$

$a° + 121° + a° + a° + 107° = 540°$

$3a° = 540° - 121° - 107°$

$3a° = 312°$

$a° = \frac{312°}{3}$

$= 104°$

$\therefore a = 104$

2. Sum of interior angles of a hexagon

$= (n - 2) \times 180°$

$= (6 - 2) \times 180°$

$= 720°$

$3b° + 4b° + 104° + 114° + 128° + 122° = 720°$

$7b° = 720° - 104° - 114° - 128° - 122°$

$7b° = 252°$

$b° = \frac{252°}{7}$

$= 36°$

$\therefore b = 36$

Practise Now 7

(i) Sum of interior angles of a regular polygon with 24 sides

$= (n - 2) \times 180°$

$= (24 - 2) \times 180°$

$= 3960°$

(ii) Size of each interior angle of a regular polygon with 24 sides

$= \frac{3960°}{24}$

$= 165°$

Practise Now 8

1. (a) The sum of exterior angles of the regular polygon is 360°.

$\therefore$ Number of sides of the polygon

$= \frac{360°}{40°}$

$= 9$

(b) Size of each exterior angle of a regular polygon

$= 180° - 178°$

$= 2°$

The sum of exterior angles of the regular polygon is 360°.

$\therefore$ Number of sides of the polygon

$= \frac{360°}{2°}$

$= 180$

2. The sum of exterior angles of the regular decagon is 360°.

$\therefore$ Size of each exterior angle of the regular decagon

$$= \frac{360°}{10}$$

$$= 36°$$

$\therefore$ Size of each interior angle of the regular decagon

$$= 180° - 36°$$

$$= 144°$$

3. The sum of exterior angles of an n-sided polygon is 360°.

$$25° + 26° + 3(180° - 161°) + (n - 5)(180° - 159°) = 360°$$

$$25° + 26° + 3(19°) + (n - 5)(21°) = 360°$$

$$25° + 26° + 57° + n(21°) - 105° = 360°$$

$$n(21°) = 360° - 25° - 26° - 57° + 105°$$

$$= 357°$$

$$n = \frac{357°}{21°}$$

$$= 17$$