Fully-Worked Solutions

PRACTICE 4

Section A

1 The sides of a regular polygon is of the same length and all its interior angles are equal.
Answer: **B**

2 A regular nonagon has 9 sides and 9 axes of symmetry.
Answer: **D**

3 Exterior angle + Interior angle = 180°
Answer: **C**

4 A heptagon has 7 sides.
Answer: **A**

5 Number of triangles $= n - 2$
$= 15 - 2$
$= 13$
Answer: **B**

6 $(180° - 80°) + 115° + 90° + x + 105° = 540°$
$x + 410° = 540°$
$x = 540° - 410°$
$x = 130°$
Answer: **C**

7 $(180° - 70°) + 105° + 95° + y + 110° = 540°$
$y + 420° = 540°$
$y = 540° - 420°$
$y = 120°$
Answer: **D**

8 $(180° - 105°) + 95° + 100° + 115° + 80° + m = 720°$
$m + 465° = 720°$
$m = 720° - 465°$
$m = 255°$
Answer: **B**

9 $x + 120° + 115° = 360°$
$x = 360° - 235°$
$x = 125°$
Answer: **C**

10 $x + 120° + 108° = 360°$
$x = 360° - 228°$
$x = 132°$
Answer: **A**

11 x = Interior angle
$108° + 117° + x = 360°$
$x = 360° - 225°$
$x = 135°$
$n = \dfrac{360°}{180° - 135°}$
$n = 8$
Answer: **B**

12 $x = \dfrac{(6 - 2) \times 180°}{6}$
$x = 120°$
$y + (180° - 120°) + (360° - 120°) + 32° = 360°$
$y + 332° = 360°$
$y = 360° - 332°$
$y = 28°$
$x + y = 120° + 28°$
$x + y = 148°$
Answer: **C**

13 $n = \dfrac{360°}{180° - 144°}$
$= \dfrac{360°}{36°}$
$= 10$
Answer: **D**

14 $x + x + 36° = 180°$
$2x = 180° - 36°$
$2x = 144°$
$x = 72°$
Answer: **D**

15 $\angle POQ = \dfrac{108°}{3} = 36°$
$\angle PQR = 180° - 36° = 144°$
$n = \dfrac{360°}{180° - 144°}$
$n = 10$
Answer: **B**

16 $x = \dfrac{180° - 120°}{2} = 30°$
$y = 120°$
$x + y = 150°$
Answer: **A**

17 $x + x + 108° = 180°$
$2x = 180° - 108°$
$2x = 72°$
$x = 36°$
$y + 108° = 180°$
$y = 180° - 108°$
$y = 72°$
Answer: **C**

18 $x + 30° = 180°$
$x = 150°$
Answer: **B**

Section B

1 (a) Polygon P is an octagon. (has 8 sides)
(b)

(i)	Number of axes of symmetry	5
(ii)	Number of vertices	5
(iii)	Number of diagonals	$\dfrac{n(n-3)}{2} = 5$

2 (a) Number of axes of symmetry = 6

(b) Number of vertices = 6

(c) $x = \dfrac{(6-2)\times 180°}{6}$

$x = 120°$

(d) $y + 120° = 180°$

$y = 60°$

Section C

1 (a) (i) $x + 83° + 80° + 125° = 360°$

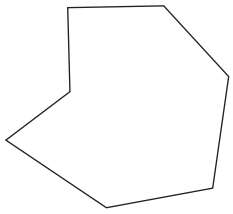
$x = 360° - 288°$

$= 72°$

(ii) Exterior angle $= 72°$

$n = \dfrac{360°}{72°} = 5$

(b) (i)



(any correct answer)

(ii) Heptagon

(iii) Number of diagonals

$= \dfrac{n(n-3)}{2}$

$= \dfrac{7(4)}{2}$

$= 14$

(iv) Sum of interior angles

$= (n-2)\times 180°$

$= 5\times 180°$

$= 900°$

(c) $x = \dfrac{(n-2)\times 180°}{n}$

$= \dfrac{(6-2)\times 180°}{6}$

$= 120°$

For *STVW*,

$y + 75° + 120° + 120° = 360°$

$y = 360° - 315°$

$y = 45°$

2 (a) $\angle OPQ = \angle OQP = \dfrac{1}{2}\times 144°$

$= 72°$

$\angle POQ + 72° + 72° = 180°$

$\angle POQ = 180° - 144° = 36°$

$\angle OPW = \angle OWP = \dfrac{1}{2}\times 120°$

$= 60°$

$\angle POW + 60° + 60° = 180°$

$\angle POW = 180° - 120°$

$= 60°$

$\angle QOW = \angle POQ + \angle POW$

$= 36° + 60°$

$= 96°$

(b) (i) $x = \dfrac{(6-2)\times 180°}{6}$

$= \dfrac{720°}{6}$

$= 120°$

(ii) $\angle TVU + 42° + 42° = 180°$

$\angle TVU = 180° - 84°$

$= 96°$

$\angle PVU + 96° + 120° = 360°$

$\angle PVU = 360° - 216°$

$= 144°$

Exterior angle $= 180° - 144°$

$= 36°$

Number of sides $= \dfrac{360°}{36°}$

$= 10$

(c) (i) $x + x + 108° = 180°$

$2x = 180° - 108°$

$x = \dfrac{72°}{2}$

$= 36°$

(ii) Exterior angle $= 220° - 180°$

$= 40°$

Number of sides $= \dfrac{360°}{40°}$

$= 9$