Angles 4 · Angles in polygons

Exam-Style Set · Mark Scheme (Total 20 marks)

M = method mark · A = accuracy mark (depends on the M mark before it) · B = independent mark

Question 1 · [3 marks]

(a)	(9 – 2) × 180	**M1**
	= **1260°**	**A1**
(b)	1260 ÷ 9 = **140°**	**B1**

Note: Alternative for (b): exterior angle = 360 ÷ 9 = 40°, so interior angle = 180 – 40 = 140°.

Question 2 · [4 marks]

(a)	Sum of interior angles = (5 – 2) × 180 = 540°	**B1**
	$2x + 2x + (3x - 15) + (x + 35) + 120 = 540$	**M1**
	$8x + 140 = 540 \rightarrow \boldsymbol{x = 50}$	**A1**
(b)	3(50) – 15 = **135°**	**B1**

Note: Check: 100 + 100 + 135 + 85 + 120 = 540. In (b), follow through from their x.

Question 3 · [3 marks]

(a)	360 ÷ 20 = **18**	**B1**
(b)	(18 – 2) × 180	**M1**
	= **2880°**	**A1**

Note: Alternative for (b): each interior angle = 160°, so the sum = 18 × 160 = 2880°.

Question 4 · [5 marks]

(a)	**120°**	**B1**
(b)	AB = AF (sides of a regular hexagon), so triangle ABF is isosceles; (180 – 120) ÷ 2	**M1**
	Angle ABF = **30°**	**A1**
(c)	Angle FBC = angle ABC – angle ABF = 120 – 30	**M1**
	= 90°	**A1**

Note: (b) needs the isosceles reason. (c) is ‘show that’: the subtraction must be seen, with no errors.

Question 5 · [5 marks]

(a)	Interior angle of the pentagon = 108° and of the hexagon = 120°	**B1**
	x = 360 – 108 – 120 (angles at a point)	**M1**
	= **132°**	**A1**
(b)	360 ÷ 25 = 14.4	**M1**
	This is not a whole number, so there cannot be a polygon with this exterior angle	**A1**

Note: In (a), accept 540 ÷ 5 = 108 and 720 ÷ 6 = 120 as evidence for B1.