Polygons

Mark Scheme 2

Level	IGCSE
Subject	Maths
Exam Board	Edexcel
Topic	Shape, Space and Measures
Sub Topic	Polygons
Booklet	Mark Scheme 2

Time Allowed: **42** **minutes**

Score: **/35**

Percentage: **/100**

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	75%	70%	60%	55%	50%	<50%

Ques	Working	Answer	Mark	Notes
1 a	$\frac{1}{2}(14+20)\times 8$ **or** $8\times 14+\frac{1}{2}\times 6\times 8$		2	M1 for a complete method
		136		A1
b	$20 - 14 \ (= 6)$		4	M1
	$'6'^2 + 8^2$ **or** $36 + 64$ **or** 100			M1 dep on previous M1
	$\sqrt{('6'^2 + 8^2)}$			M1 dep on previous M1
		10		A1
				Total 6 marks

2 (a)	$360 \div 15$ **or** $\frac{(n-2)180}{n}=180-15$ oe		2	M1
		24		A1
(b)	$3 \times 180/5$ or $(180 - 360 \div 5)$ $(=108)$		3	M1 must be no contradiction on diagram or in working
	$360 - 3 \times$ "108"			M1 dep
		36		A1
	Alternative for (b): $360/5$ $(=72)$			M1 must be no contradiction on diagram or in working
	$(180 - $ "72"$\times 2)$			M1 dep
		36		A1
				Total 5 marks

3.	(a)	angle MRQ (or RMQ) = x **or** $\dfrac{180-y}{2}$		2	M1	could be marked on diagram **or** for a correct equation in x and y
			$180 - 2x$		A1	oe eg $2(90 - x)$, $2(180 - x) - 180$ etc
	(b)	$(6 - 2) \times 180$ oe $(=720)$		4	M1	or $(180 - 360 \div 6) \times 6$
		$"720" - (90 + 115 + 144 + 87)$, $[720 - 436]$ **or** 284			M1dep	
		$"284" \div 2$			M1dep	
			142		A1	
		Alternative				
		$180-90(=90)$, $180-115(=65)$, $180-144(=36)$, $180-87(=93)$		4	M1	A correct method to find each of the exterior angles at A,C,D & E – angles could be seen on diagram.
		$360 - ("90"+"65"+"36"+"93")$, $[360-284]$ $(= 76)$			M1dep	A correct method to find the total of the remaining exterior angles
		$180 - ("76" \div 2)$			M1dep	A correct method to find k
			142		A1	
						Total 6 marks

4.	$180 - \dfrac{360}{10}$ or $\dfrac{(10-2)\times 180}{10}$ or 144 oe		4	M1	Unless inconsistently labelled
	$\dfrac{180-'144'}{2}$ or 18			M1	Or M2 for $144 - (180 - 144)$
	'144' $- 2 \times$ '18'			M1	
		108		A1	dep on M1
	Alternative				
	Pentagon approach – drawing in a pentagon or a statement recognising that the required angle is one of a regular pentagon		4	M1	May be implied by further work
	$180 - \dfrac{360}{5}$ or $\dfrac{(5-2)\times 180}{5}$			M2	(M1 for exterior angle of pentagon as long as not seen as interior angle or given as answer)
		108		A1	dep on M1
					Total 4 marks

Q	Working	Answer	Mark	Notes	
5.	$\dfrac{360}{8}$ or $180 - \dfrac{(8-2)\times 180}{8}$		2	M1	For complete correct method for exterior angle
		45		A1	Answer of 135 scores M0A0
					Total 2 marks

6.	(a)		63	1	B1	
	(b)		50	1	B1	
	(c)	Eg $(6 - 2) \times 180$ or 4×180 or 720 oe			M1	For complete method to find the total of interior angles or 720
		Eg $3x + x + 164 + 139 + 97 + 156 = 720$ or $4x + 556 = 720$ oe or			M1	Dep For a correct equation using their 720 or For a complete numerical method
		$\frac{\text{"}720\text{"} - (164 + 139 + 97 + 156)}{4}$ or $\frac{\text{"}720\text{"} - 556}{4}$ or $\frac{164}{4}$ oe	41	3	A1	
		Alternative Method Eg $180 - 156 + 180 - 139 + 180 - 164 + 180 - 97 + 180 - x + 180 - 3x = 360$ or $24 + 41 + 16 + 83 + 180 - x + 180 - 3x = 360$ or $1080 - 556 - 4x = 360$			M2	For an equation coming from the correct method relating to the sum of exterior angles.
			41	3	A1	
						Total 5 marks

7.	a	$360 - 2 \times 111 - 90$		48	2	M1 A1	A complete method to find angle *ABC*
	b	$111 - 90$		21	2	M1 A1	
	c	$540 - 90 - 90 - 111 - 111$ **or** $180 - 2 \times$ '21' **or** $2 \times (180 - 111)$ **or** $360 - 111 = 249$ $\quad 180 - (360 - $'21'$ - 249 - 48)$ oe		138	3	M2 A1	For a fully correct method to find angle *y* or M1 if using pentagon for $(5-2) \times 180$ $(=540)$ or for an isosceles triangle drawn with *y* at apex or for showing use of parallel lines on diagram
							Total 7 marks