AQA Qualifications

AQA Level 2 Certificate

FURTHER MATHEMATICS

Level 2 (8360)

Mark Scheme

Worksheet 2

Geometric Problems and Proof

Version 2.0

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Glossary for Mark Schemes

These examinations are marked in such a way as to award positive achievement wherever possible. Thus, for these papers, marks are awarded under various categories.

M	Method marks are awarded for a correct method which could lead to a correct answer.
A	Accuracy marks are awarded when following on from a correct method. It is not necessary to always see the method. This can be implied.
B	Marks awarded independent of method.
M Dep	A method mark dependent on a previous method mark being awarded.
B Dep	A mark that can only be awarded if a previous independent mark has been awarded.
ft	Follow through marks. Marks awarded following a mistake in an earlier step.
SC	Special case. Marks awarded within the scheme for a common misinterpretation which has some mathematical worth.
oe	Or equivalent. Accept answers that are equivalent. eg, accept 0.5 as well as $\frac{1}{2}$

2 Geometric Problems and Proof

Question	Answer	Mark	Comments
1	Let angle $SQR = x$	M1	Any order of angles
	$\therefore$ angle $RPQ = x$ alternate segment		
	$\therefore$ angle $RQP = x$ isosceles triangle	M1	
	$\therefore$ $\angle RQS = \angle RQP$	A1	SC2 'Correct' solution without reasons
2	Let angle $PSR = x$ = angle QRS	M1	$\angle PQR = 180 - x$
	$\therefore$ $\angle SPQ = 180 - x$ Allied angles on parallel lines		
	$\therefore$ $\angle SPQ + \angle QRS = 180$	A1	$\angle PSR + \angle PQR = 180$
	$PQRS$ is a cyclic quadrilateral (converse of) opposite angles add up to 180°	A1	SC2 'Correct' solution without reasons
3	$p + r = 180$	M1	
	$4x + 5x = 180$	M1	oe
	$(9x = 180)$ $x = 20$	A1	
	$6x = 120$	M1	ft Their x
	$s = 60$	A1 ft	ft Their x

Question	Answer	Mark	Comments
4	$\angle BED = x$ angles in same segment	M1	
	$\angle AEB = 90°$ angle in semicircle = 90°	A1	
	In ΔACE $y + x + 2x + x + 90 = 180$ angle sum of a triangle = 180	A1	
	$y + 4x = 180 - 90$ $= 90$	A1	SC2 'Correct' solution without reasons
5	$2x + 2y = 180$ opposite angles of a cyclic quadrilateral = 180	M1	
	$x + y = 90$	A1	
	$\therefore \angle QPS = 90$ angle sum of triangle = 180	A1	
	QS is diameter (converse of) angle in a semicircle = 90)	A1	SC2 'Correct' solution without reasons
6	Let $\angle SXT = x$ $\therefore \angle STX = x$ isosceles triangle	M1	
	$\therefore \angle SRT = x$ alternate segment	M1	
	$\therefore$ triangle RXT = is isosceles - 2 base angles equal	A1	SC2 'Correct' solution without reasons

Question	Answer	Mark	Comments
7	$\angle OAB = x$ isosceles triangle	M1	
	$\angle BOA = 180 - 2x$ angle sum of triangle = 180	M1	
	Reflex $\hat{BOA} = 360 - (180 - 2x)$	M1	
	(Angles at a point = 360) $= 180 + 2x$	A1	
	$y = 90 + x$ Angle at centre = 2 × angle at circumference	A1	SC3 'Correct' solution without reasons
8	$\angle QTP = x$ isosceles triangle	M1	
	$\angle VTR = x$ vertically opposite angles equal	M1	
	$\angle TQP = x = \angle RST$ exterior angle of cyclic quadrilateral = opposite interior angle	M1	oe
	$\therefore \angle VTR = \angle RST$ *PVT* is tangent (converse of) alternate segment theorem	A2	SC3 'Correct' solution without reasons
9	$\angle EDB = x$ alternate segment	M1	
	$\therefore \angle DCA = x$ corresponding angles equal	M1	
	$\therefore \angle DAB = x$ alternate segment	M1	
	ie, $\angle DAB = \angle EBF$ $\therefore$ *AD* is parallel to *BE* (converse of) corresponding angles equal	A2	SC3 'Correct' solution without reasons