Paper: 1MA1/1H				
Question	**Working**	**Answer**	**Mark**	**Notes**
3 **Q1**	*CB* extended to form *CG*	Reasoning	B1 M1 C2 (C1	for 35 **or** 75 **or** 145 **or** 105 **or** *DEF* = 70, marked on the diagram or 3 letter description for 180-70-35 **or** 180-75-35 **or** a correct pair of angles that would lead to 75 or 70, eg *AFB* = 35 and *FAB* = 75 **or** *AFB* = 35 and *ABG* = 75 **or** *FBC* = 35 and *ABG* = 75 **or** *EDF* = 75 and *DEF* = 70 **or** *FDC* = 105 and *FBC* = 35 **or** *ABC* = 105 and *FBC* = 35 (dep on B1M1) All figures correct with all appropriate reasons stated. Angles must be clearly labelled or on the diagram. Full solution must be seen (dep on B1 or M1) for one reason clearly used and stated.) Corresponding angles are equal, alternate angles are equal, opposite angles in a parallelogram are equal, angles in a triangle sum to 180, angles on a straight line sum to 180, vertically opposite angles are equal, vertically opposite angles are equal, angles in a quadrilateral sum to 360, co-interior angles sum to 180, allied angles sum to 180, angles around a point sum to 360

Paper: 1MA1/2H				
Question	**Working**	**Answer**	**Mark**	**Notes**
12 **Q2**		15	P1 P1 A1	for a process to find the interior or exterior angle of a regular 12 sided polygon e.g. $\frac{10\times180}{12}$ (= 150) or $\frac{360}{12}$ (= 30), must be no contradictions for process to find angle *STR*, eg $\frac{180-"150"}{2}$ or $\frac{"30"}{2}$ cao

Paper 1MA1: 3H				
Question	**Working**	**Answer**	**Mark**	**Notes**
5 **Q3**		Shows polygon is a hexagon	M1 M1 A1 C1	for a complete method to find the interior or exterior angle of the dodecagon eg $180 - \frac{360}{12}$, $\frac{180}{12}(12-2)$ oe (= 150), 360 ÷ 12 (=30) for a complete method to find the interior angle of polygon **P** eg at *B* or *C*: 360 – "150" – 90 (= 120) or "30" + 90 (= 120) **or** for a complete method to find the interior or exterior angle of the hexagon eg $180 - \frac{360}{6}$, $\frac{180}{6}(6-2)$ oe (= 120), 360 ÷ 6 (= 60) for 30 and 120 **or** 30 and 60 **or** 120 and 150 **or** 60 and 150 complete solution, fully supported by accurate figures

Paper: 1MA1/3H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
8 **Q4**	140	P1	for complete process to find sum of the interior angles of a pentagon eg $(5 - 2) \times 180$ or exterior $360 \div 5 = 72$, interior $180 - 72 = 108$, 108×5 **OR** for complete process to find sum of the exterior angles of the pentagon eg $(180 - x) + (180 - 2x) + (180 - 125) + (180 - 115) + (180 - 90)$	Must be a complete process that could lead to a figure of 540 if that process is evaluated incorrectly
		A1	for sum of interior angles is 540 **OR** for sum of exterior angles is 360	360 must be identified as the sum of the exterior angles
		P1	for start to process to find angle *ABC* eg [angles in a pentagon] – 115 – 125 – 90 (= 210) or $115 + 125 + 90 + x + 2x =$ [angles in a pentagon] **OR** $(180 - x) + (180 - 2x) + (180 - 125) + (180 - 115) + (180 - 90) = 360$	Award provided [angles in a pentagon] is greater than 400 Algebraic route needs to show both sides of the equation. LHS of equation may be simplified
		P1	for process to find angle *ABC* eg "210" ÷ 3 (= 70), "210" divided in the ratio 2 : 1 **or** for process to find angle *BCD* eg $\frac{2}{3} \times$ "210" **or** for $3x =$ "210" or $-3x = -$"210"	Award if 70 is given for either *ABC* or *BCD* on the diagram
		A1	cao	Award marks for 140 on the diagram with working and not contradicted by the answer line. Award 0 marks for 140 without working.

Paper: 1MA1/3H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
5 **Q5**	162 supported	M1	for method to find sum of the interior angles of a hexagon eg $(6 - 2) \times 180$ (= 720) oe **OR** for method to find sum of the interior angles of a pentagon, eg $(5 - 2) \times 180$ (= 540) **OR** for method to find angle *AFC* or *BCF*, eg $(360 - 2 \times 117) \div 2$ (= 63) **OR** for dropping a perpendicular from *A* or *B* to *ED* with 90° marked on *ED* and 27° at the top	Must be a complete process that would lead to a figure of 720 if evaluated correctly. For a pentagon there must be an indication that they have divided the hexagon into two halves. 63 may be shown on the diagram for angle *AFC* or angle *BCF*
		M1	for method to use ratio 2 : 1 eg marks as $2x$ and x or as x and $\frac{1}{2}x$ on diagram **OR** for ([angle sum of hexagon] $- 2 \times 117) \div 6$ (= 81) oe or ([angle sum of hexagon] $\div 2 - 117) \div 3$ (= 81) oe **or** $117 + 117 + 2x + 2x + x + x =$ [angle sum of hexagon] oe **OR** eg ([angle sum of pentagon] $-$ 117 $-$ 180) $\div$ 3 (= 81) oe **or** $117 + 180 + 2x + x =$ [angle sum of pentagon] oe	Ratio must be used correctly if awarded for diagram Award provided [angle sum of hexagon] is greater than 700 or [angle sum of pentagon] is greater than 500 Algebraic route needs to show both sides of the equation. LHS of equation may be simplified.
		M1	for finding angle *FED* = 81 or for finding angle *CDE* = 81 **OR** for complete process to find angle *AFE* eg ([angle sum of hexagon] $- 2 \times 117) \div 6 \times 2$ oe **OR** ([angle sum of pentagon] $-$ 117 $-$ 180) $\div$ 3 $\times$ 2 oe	This may be shown by solving a correct equation to find the value of *x*.
		C1	for accurate working leading to angle *AFE* = 162	Award marks for 162 on the diagram with working and not contradicted by the answer line. Award 0 marks for 162 without working.

Paper: 1MA1/1H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
6 **Q6**	85 with working and reasons	M1	for correct use of corresponding angles eg *AEB* = 63 **or** co-interior angles eg *BCD* = 180 – 148 (= 32) or *DEB* = 180 – 63 (= 117)	Angles must be clearly labelled on the diagram or otherwise identified. Full solution must be seen.
		M1	(dep) for a complete method to find angle *EAB* eg. 180 – "63" – (180 – 148) **or** 148 – "63" **or** "117" – (180 – 148)	Correct method can be implied from angles on the diagram if no ambiguity or contradiction.
		A1	for *EAB* = 85 (identified)	
		C2	(dep on M2) all working correct with all appropriate reasons stated. Corresponding angles are equal Allied angles / Co-interior angles add up to 180 Angles on a straight line add up to 180 Angles in a triangle add up to 180 The exterior angle of a triangle is equal to the sum of the interior opposite angles.	When reasons are given the key words underlined must be present. Reasons need to be linked to their method; any reasons not linked, do not credit. There should be no incorrect reasons given.
		(C1	for **one** reason relating to parallel lines clearly used and stated **or** for any **two** reasons clearly stated for their fully correct method)	

Paper: 1MA1/2H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
3 **Q7**	60	M1 M1 A1 C1	use of parallel lines to find an angle eg *ABE*=70 **or** *EBG*=75 **or** *EBC* = 110 **or** shows parts of *x* as 35 or 25 for a complete method to find angle *x*; could be in working or on the diagram for *x* = 60 (dep on M1) for one reason linked to parallel lines and one other reason, supported by working taken from: alternate angles are equal, allied angles / co-interior angles add up to 180, angles on a straight line add up to 180, angles in a triangle add up to 180°	Parts of *x* should be identified on the diagram by the insertion of a dividing line through angle *x* (need not be identified or drawn parallel). Correct method can be implied from angles on the diagram if no ambiguity or contradiction. Underlined words need to be shown; reasons need to be linked to their method; any reasons not linked do not credit. There should be no incorrect reasons given.

Paper: 1MA1/1H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
5 **Q8**	93	M1 M1 M1 A1	for method to find angle *ACB*, eg. 180 – 75 – 51 (= 54) (dep M1) for method to use the ratio, eg. "54" ÷ (2 + 1) (= 18) for complete method, eg. 180 – 51 – "18" × 2 or 75 + "18" oe cao	Angles may be shown on diagram but must not be ambiguous eg. M0 for angle of 54° shown in the wrong place

Paper: 1MA1/3H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
8 **Q9**	45	P1 P1 P1 A1	for 180 – 117 (=63) **or** states, or uses, exterior angle + x =117 for process to find the exterior or the interior angle of the pentagon, eg 360 ÷ 5(=72) **or** 180 – (360 ÷ 5) (=108) **or** ((5–2) × 180) ÷ 5 (=108) for a complete process to find x, eg 180 – "72" – "63" **or** "108" – "63" **or** 117 – "72" cao	Angles may be shown on the diagram. Any angle labelled correctly as 63 and not contradicted scores this mark Exterior = 108 or interior =72 does not score the mark An answer of 45 with no supporting working scores 0

Paper: 1MA1/1H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
5 **Q10**	132	M1 M1 A1	for finding an exterior angle eg 360 ÷ 6 (= 60) **or** 360 ÷ 5 (= 72) **or** an interior angle eg 180 × 4 ÷ 6 (= 120) or 180 × 3 ÷ 5 (= 108) for a complete method eg 360 − "120" − "108" or "60" + "72" cao	Angles may be shown on the diagram. Only award this mark for an angle that is not contradicted Answer only award no marks