

Angles in Parallel Lines Past Paper Questions (MS)



Q1.

Question	Answer	Mark	Mark scheme	Additional guidance
(a)	Correct evaluation	C1	for explanation eg x is not a base angle or states $x = 54^\circ$	
(b)	Correct or corrected reasoning given	C1	eg (because) alternate angles are equal, or Allied angles / Co-interior angles add up to 180 or they are not corresponding (they are alternate) OR selects correct reason used by William	

Q2.

PAPER: 1MA0_2H				
Question	Working	Answer	Mark	Notes
*		54 with reasons	3	M1 for angle RWY or angle $TWZ = 180 - 126 (= 54)$ or angle TWR or angle $WRS = 126$ (may be marked on diagram) A1 for 54 C1 for appropriate reasons for method shown eg. <u>Angles on a straight line</u> add up to <u>180</u> and <u>Alternate angles</u> are equal OR <u>Corresponding angles</u> are equal and <u>Angles on a straight line</u> add up to <u>180</u> OR <u>Vertically opposite angles</u> are equal and <u>Allied angles / Co-interior angles</u> add up to <u>180</u> OR <u>Angles at a point</u> add up to <u>360</u> with other reasons as above.



Q3.

Question	Answer	Mark	Mark scheme	Additional guidance
(a)	40	M1	for using 90, eg $90 - 25 = 25$	$90 - 25$ is enough for this mark
		A1	cao	
(b)(i)	b or d with reason	B1	for b or d (or both)	A correct answer can be implied by writing 125 immediately next to b or d (or both) as long as 125 is not written next to an incorrect angle.
		C1	(dep) for appropriate reason(s) vertically <u>opposite angles</u> are equal vertically <u>opposite angles</u> are equal <u>corresponding</u> angles are equal <u>alternate</u> angles are equal <u>angles</u> on a <u>straight line</u> add up to 180	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.
(ii)	reason	C1	for correct explanation using 360 or a full explanation using angles around a point Acceptable examples Because 360 around a point $360 - 125 = 235$ $125 + 235 = 360$ Because they add to 360 Not acceptable examples Because b is 125	Using 360 appropriately and not in an incorrect setting

Q4.

PAPER: IMA0/1F				
Question	Working	Answer	Mark	Notes
*		95° with reasons	4	<p>M1 for angle $DBC = 180 - 125 (= 55)$ or angle $EAC = 180 - 125 (= 55)$ (May be on diagram) A1 for $x = 95$ C2 (dep on M1) with full reasons for their given method, e.g. <u>angles</u> on a <u>straight line</u> add up to <u>180°</u> and <u>angles</u> in a <u>triangle</u> add up to <u>180°</u> and <u>corresponding angles</u> are equal or <u>allied angles</u> / <u>co-interior angles</u> add up to <u>180°</u> and <u>angles</u> in a <u>triangle</u> add up to <u>180°</u> (C1 (dep on M1) for one appropriate reason linked to parallel lines)</p> <p>M1 for angle $CDB = 125 - 30 (= 95)$ (May be on diagram) A1 for $x = 95$ C2 (dep on M1) for full reasons, for their given method, e.g. <u>exterior angles</u> are equal to the sum of the <u>interior opposite angles</u> and <u>corresponding angles</u> are equal (C1 (dep on M1) for one of these appropriate reasons linked to parallel lines)</p>



Q5.

Question	Answer	Mark	Mark scheme	Additional guidance
	85 with working and reasons	M1	for correct use of corresponding angles eg $\angle AEB = 63$ or co-interior angles eg $\angle BCD = 180 - 148 (= 32)$ or $\angle DEB = 180 - 63 (= 117)$	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 $\angle EAB$ 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 $\angle EAB = 85$ (identified)	
		C2	(dep on M2) all working correct with all appropriate reasons stated. <u>Corresponding</u> angles are equal <u>Allied</u> angles / <u>Co-interior</u> angles add up to 180 <u>Angles</u> on a straight <u>line</u> add up to 180 <u>Angles</u> in a <u>triangle</u> add up to 180 The <u>exterior angle</u> of a triangle is <u>equal</u> to the sum of the <u>interior opposite angles</u> .	When reasons are given the key words <u>underlined</u> 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 <u>one</u> reason relating to parallel lines clearly used and stated or for any <u>two</u> reasons clearly stated for their fully correct method)	

Q6.

Question	Working	Answer	Mark	Notes
	<p>Angle $\angle ABE = 40$ (vertically opposite angles are equal) Angle $\angle BAE = \text{angle } \angle BEA = (180 - 40)/2 = 70$ (base angles of an isos triangle are equal) $x = 70$ (alternate angles on parallel lines are equal)</p> <p>OR</p> <p>Angle $\angle ABE = 40$ (vertically opposite angles are equal) Angle $\angle BAE = \text{angle } \angle BEA = (180 - 40)/2 = 70$ (base angles of an isosceles triangle are equal) Angle $\angle BEF = 40$ (corresponding angles are equal) $x = 180 - 70 - 40 = 70$ (angles as a straight line add up to 180°)</p>	70	5	<p>B1 for angle $\angle ABE = 40$, could be marked on the diagram M1 for $(180 - '40')/2 (= 70)$ A1 for 70° identified as the angle x°</p> <p>C2 for fully correct reasons: 'vertically <u>opposite</u> angles are equal' or 'vertically <u>opposite</u> angles are equal' '<u>base</u> angles of an <u>isosceles</u> triangle are equal' '<u>alternate</u> angles on parallel lines are equal' (C1 for just one correct reason quoted)</p> <p>OR</p> <p>B1 for angle $\angle ABE = 40$ or angle $\angle BEF = 40$, could be marked on the diagram M1 for $(180 - '40')/2 (= 70)$ A1 for 70° identified as the angle x° C2 for fully correct reasons: 'vertically <u>opposite</u> angles are equal' or 'vertically <u>opposite</u> angles are equal' '<u>base</u> angles of an <u>isosceles</u> triangle are equal' '<u>corresponding</u> angles on parallel lines are equal' '<u>angles</u> on a <u>straight line</u> add up to <u>180</u>' (C1 for just one correct reason quoted)</p>

Q7.



Question	Working	Answer	Mark	Notes
	<p>Angle $DEC = 180 - 41 = 139$ <u>Angles on a straight line</u> sum to 180° Angle $EDC = 60 - 38$ or Angle $ABD = 180 - 120 - 38 (=22)$ <u>Co-interior/allied angles</u> of parallel lines sum to 180° or <u>Angles in a triangle</u> sum to 180° and <u>Alternate angles</u> $x = 180 - 139 - 22 (=19)$ Angles in a triangle sum to 180°</p> <p>OR</p> <p>Angle $ADC = 180 - 120 = 60^\circ$ <u>Co-interior/allied angles</u> of parallel lines sum to 180° Angle $EDC = 22^\circ$ Angle $ECD = 41 - 22 = 19^\circ$ <u>Exterior angle of triangle</u> equals sum of the two <u>opposite interior angles</u></p> <p>OR</p> <p>Angle $DBC = 38^\circ$ <u>Alternate angles</u> Angle $BCE = 101^\circ$ <u>Angle sum of a triangle</u> is 180° Angle $BCD = 120^\circ$ <u>Opposite angles of a parallelogram</u> are equal Angle $ECD = 120 - 101 = 19^\circ$</p>	<p>$x = 19^\circ$ and reasons</p>	<p>3</p>	<p>M1 for $DBC = 38^\circ$ or $ADC = 60^\circ$ (can be implied by $BDC = 22^\circ$) or $ABC = 60^\circ$ or $DCB = 120^\circ$ or $(ABD =) 180 - 120 - 38 (=22)$</p> <p>M1 for $(BDC =) 60 - 38 (=22)$ or $BDC = '22'$ or $(DEC =) 180 - 41 (=139)$ or $(BCE =) 180 - 41 - 38 (=101)$</p> <p>M1 (dep on both previous M1) for complete correct method to find x or $(x =) 19$</p> <p>C1 for $x = 19^\circ$ AND <u>Co-interior/allied angles</u> of parallel lines sum to 180° or <u>Opposite angles</u> of a parallelogram are equal or <u>Alternate angles</u></p> <p>AND <u>Angles on a straight line</u> sum to 180° or <u>Angles in a triangle</u> sum to 180° or <u>Exterior angle of triangle</u> equals sum of the two <u>opposite interior angles</u> or <u>Angles in a quadrilateral</u> sum to 360°</p>



Q8.

Question	Answer	Mark	Mark scheme	Additional guidance
(a)	Proof	C1	for starting the proof, identifying a pair of relevant equal sides or angles with reasons from $AD = BC$ (opposite sides of a parallelogram are equal) angle $PAD =$ angle QCB (opposite angles of a parallelogram are equal) angle $ADP =$ angle CBQ (given or both 90°)	Congruency conclusion must include a reference to ASA
		C1	(dep C1) for complete identification of all three equal aspects with reasons	
		C1	(dep C2) for conclusion of congruency proof	
(b)	Explanation	C1	for identifying a pair of equal sides or angles in $APCQ$, with reason, eg $AP = QC$ since triangle ADP is congruent to triangle CBQ	
		C1	(dep C1) for reasoning that $APCQ$ is a parallelogram so opposite sides of a parallelogram are parallel	

Q9.

Question	Working	Answer	Mark	Notes
		88	4	M1 for $(\angle APT =) 180 - (32 + 90) (= 58)$ M1 for $(\angle PTR =) "58"$ M1 for $360 - ("58" + 124 + 90)$ A1 cao OR (line XY drawn through Q parallel to AB) M1 for $(\angle QRD =) 180 - 124 (= 56)$ M1 for $(\angle XQR =) "56"$ M1 for $(\angle PQX =) 32$ A1 cao



Q10.

PAPER: 5MB2H_01				
Question	Working	Answer	Mark	Notes
*		80	4	<p>B1 for $EBF = 50$ or $ABE = 50$</p> <p>M1 for angles given that can lead to $x = 80$ as the next step eg $EBF = 50$ and $ABE = 50$ eg $EBF = 50$ and $BFG = 100$ eg $EBF = 50$ and $BFE = 80$ eg $EBF = 50$ and $DEB = 130$ and $ABE = 50$</p> <p>A1 cao</p> <p>C1 for stating correct reasons appropriate to their method shown</p> <p>eg Base <u>angles of an isosceles triangle are equal.</u> with <u>Angles in a triangle add up to 180°</u> with <u>Alternate angles are equal</u></p> <p>eg Base <u>angles of an isosceles triangle are equal.</u> with <u>Alternate angles are equal</u> with <u>Angles on a straight line add up to 180°</u></p> <p>eg Base <u>angles of an isosceles triangle are equal.</u> with <u>The exterior angle of a triangle is equal to the sum of the opposite interior angles.</u> with <u>Allied angles / Co-interior angles add up to 180°</u></p>

Q11.

PAPER: 5MB2H_01				
Question	Working	Answer	Mark	Notes
(i)		126	2	B1 cao
(ii)		Reason		<p>B1 for reason relating to geometrical property & parallel lines which is not contradicted by method shown elsewhere eg <u>alternate angles are equal,</u> <u>corresponding angles are equal,</u> <u>allied angles / co-interior angles add up to 180°</u></p>