1	**Alternative method 1**		
	5 : 1 or 1 : 5 or $\frac{5}{6}$ or $\frac{1}{6}$ or 6 (parts)	M1	may be implied by second mark may be seen on diagram
	180 ÷ 6 or 30	M1dep	
	150	A1	
	Alternative method 2		
	$5x + x = 180$ or $6x = 180$	M1	any letter may be implied by second mark
	180 ÷ 6 or 30	M1dep	
	150	A1	
	Additional Guidance		
	If Trial and Improvement used, 30 seen is M2 but 150 must be chosen as the answer for M2A1		
	360 ÷ 6		M1M0A0

2	90 ÷ 5 or 18	M1	
	2 × their 18 or 36	M1dep	M2 $\frac{2}{5} \times 90$
	180 – 90 – their 36	M1dep	oe eg 90 – their 36
	90 36 54	A1	any order
	Additional Guidance		
	Beware of incorrect methods, eg dividing 180 by 5 180 ÷ 5 = 36 180 ÷ 2 = 90 180 – 90 – 36 = 54 Answer 90, 36, 54		M0M0M0A0
	Beware of 18 coming from wrong working 90 ÷ 2 = 45 90 ÷ 5 = 18 90 ÷ 7 = … However, it is not incorrect to work with 180 ÷ 10		M0M0M0A0
	Trial and Improvement scores 0 or 4		

Q	Answer	Mark	Comments
3	100°	B1	

Q	Answer	Mark	Comments
4	b	B1	

Q	Answer	Mark	Comments
5	$x + 53 + 48 = 180$ or $53 + 48$ or 101 or $180 - 53$ or 127 or any correct angle marked as 53 or 127 on the diagram	M1	oe equation in x
	$180 - (53 + 48)$ or $360 - 53 - 53 - (180 - 53) - 48$	M1dep	oe eg $180 - 101$ or $127 - 48$
	79	A1	
	Additional Guidance		
	M1 may be awarded for correct work, with no or incorrect answer, even if this is seen amongst multiple attempts		
	Correct angle on diagram may be credited even if alongside other incorrectly marked angles or incorrect or no working in working lines		
	Correct method in the working lines may be credited even with incorrect angles on the diagram		
	Method for 79 followed by further work to their 79		M1M1A0

Q	Answer	Mark	Comments
6(a)	$180 - 112$ or 68 or $3y + y + 112 = 180$	M1	oe
	their $68 \div (3 + 1)$ or their $68 \div 4$ or $y = \frac{\text{their } 68}{4}$ or 51 or $x = 17$	M1	oe their 68 must be < 180 but not 112 51 or $x = 17$ imply M1M1
	17	A1	
	Additional Guidance		
	Check diagram for workings and answer		
	17 seen in diagram or working and 51 on answer line		M1M1A0
	$180 \div 4$		M0M0
	$68 \div 3$		M1M0
	$180 - 112 = 78$ and $78 \div 4$ $78 \div 4$		M1M1 M0M1
	Embedded answer eg $4 \times 17 + 112 = 180$		M1M1A0

Q	Answer	Mark	Comments
7	b and c	B1	

Q	Answer	Mark	Comments
8	**Alternative method 1 – numerical**		
	1 and 5 and 3 or 9 (parts) or numbers in the ratio 1 : 5 : 3 or (angle sum on a straight line =) 180	M1	oe may be seen in a ratio eg $\frac{1}{5} : 1 : \frac{3}{5}$ or $\frac{1}{3} : \frac{5}{3} : 1$ numbers can be in any order eg 30, 10, 50
	$180 \div (1 + 5 + 3)$ or 20 or $180 \div \frac{9}{5}$	M1dep	oe
	100	A1	
	Alternative method 2 – algebraic		
	x and $5x$ and $3x$ or $9x$ or (angle sum on a straight line =) 180	M1	oe correct terms with any angle as x any letter, any order may be seen on diagram
	Correct equation with correct method to solve for one angle	M1dep	eg $x + 5x + 3x = 180$ and $180 \div (1 + 5 + 3)$
	100	A1	
	Additional Guidance		
	$x + 5x + 3x = 360$ or $360 \div 9$		M1M0A0
	$\frac{1}{5}x + x + \frac{3}{5}x = 180$ and $180 \div \left(\frac{1}{5} + 1 + \frac{3}{5}\right)$		M1M1
	$\frac{1}{3}x + \frac{5}{3}x + x = 180$ and $180 \div \left(\frac{1}{3} + \frac{5}{3} + 1\right)$		M1M1
	Angle *EBD* marked as 100 on the diagram with answer line blank		M1M1A1
	20 and 100 in working with no or incorrect answer chosen		M1M1A0

Q	Answer	Mark	Comments
9	$360 \div 9 (= 40)$ and $40 \times 7 = 280$ or $360 \div 9 (= 40)$ and $40 \times 2 (= 80)$ and $80 + 280 = 360$ or $40 \times 2 (= 80)$ and $40 \times 7 (= 280)$ and $80 + 280 = 360$ or $280 \div 7 (= 40)$ and $40 \times 9 = 360$ or $2:7 = 80:280$ and $80 + 280 = 360$ or $360 - 280 (= 80)$ and $80:280 = 2:7$	B2	oe B1 $360 \div 9$ or $280 \div 7$ or 40 oe or $\frac{2}{9}$ or $\frac{7}{9}$ or $360 - 280$ or 80 oe

Additional Guidance

80 and 280 shown on the diagram is not oe for $80 + 280 = 360$	
$360 \div 9 \times 7 = 280$	B2
$360 \div 9$ and 40×2 and $2:7 = 80:280$	B2
$360 \div 9 = 40$ and $2:7 = 80:280$ (40×2 or 40×7 missing)	B1
$40 \times 7 = 280$ without $360 \div 9$ eg $40 \times 7 = 280$ and $80 + 280 = 360$ ($360 \div 9 = 40$ or 40×2 missing)	B1
$80:280$ and $80 + 280 = 360$ ($2:7 = 80:280$ missing)	B1
$360 \div 9 = 40$ and $80 + 280 = 360$ (40×2 or 40×7 missing)	B1
$280 \div 7 = 40$ and $360 - 280 = 80$ (40×2 or 40×9 missing)	B1
$280 \div 7$ and 40×2 and $80:280 = 2:7$ ($80 + 280 = 360$ missing)	B1
$80 + 280 = 360$	B1

Q	Answer	Mark	Comments
10	No ticked and appropriate working to show *AB* and *CD* are not parallel	B2	B1 any correct angle on the diagram eg 105 opposite the 105 given eg 85 written next to the 95 given or any correct angle which assumes lines are parallel eg 95 written opposite the 105 given or any correct angle evaluation seen in working eg 180 – 105 = 75
	Additional Guidance		
	Angles must be shown on diagram or clearly identified to score B2		
	Ignore any incorrect or irrelevant terminology alongside correct working		
	"No" may be implied		
	Condone an incorrect angle if not subsequently used		
	Crossed out angles on diagram may be used to support working		
	No and 95 should be 105	B2	
	No and 95 written opposite the given 95 and 95 is not equal to 105	B2	
	No and 105 opposite the given 105 and 85 next to the 95 and 105 + 85 = 190 (or should be 180)	B2	
	No and 85 written next to the given 95 and 75 written next to the given 105 and $85 \neq 75$	B2	
	No and 75 written alongside 105 and 75 written underneath 95 and 95 + 75 = 170 (or should be 180)	B2	
	No and 95 written opposite 105 and the other two angles 75 and 95 + 75 + 75 + 105 = 350 (or should be 360)	B2	
	95 + 105 = 200 is not a correct angle evaluation No and 95 + 105 = 200 and if it is 180 they will be parallel	B0	

Q	Answer	Mark	Comments
11(a)	43	B1	

Q	Answer	Mark	Comments
11(b)	118	B1	

Q	Answer	Mark	Comments
11(c)	55	B1	

Q	Answer	Mark	Comments
12	**Alternative method 1: working separately**		
	180 – 127 or 53	M1	implied by 106
	360 – 90 – 163 or 107	M1	oe implied by 53.5
	No and 106 and 107 or No and 53 and 53.5 or No and 53 and 107 – 53 = 54	A1	
	Alternative method 2: starting with y		
	180 – 127 or 53	M1	implied by 106
	360 – 90 – 2 × their 53 or 164 or 360 – 163 – 2 × their 53 or 91 or 2 × their 53 + 90 + 163 or 359	M1dep	oe
	No and 164 or No and 91 or No and 359	A1	
	Alternative method 3: starting with x		
	360 – 90 – 163 or 107	M1	oe implied by 53.5
	180 – their 107 ÷ 2 or 126.5 or 127 + their 107 ÷ 2 or 180.5	M1dep	oe
	No and 126.5 or No and 180.5	A1	