

Question		Answer	Marks	Part Marks and Guidance	
1		$x = 2.5$ oe $y = -2$	4	<p>M1 for $12x + 3y = 24$ or $4x - 6y = 22$</p> <p>Dep M1 for $7x = -14$ or $14x = 35$ oe</p> <p>A1 for $x = 2.5$ or $y = -2$</p> <p>Or if sub'n used eg</p> <p>M1 for $2x - 3(8 - 4x) = 11$</p> <p>Dep M1 for $14x = 35$ oe</p> <p>A1 $x = 2.5$ for oe</p>	<p>For multiplying to get coefficients equal (allow 1 error)</p> <p>For adding or subtracting (allow 1 error)</p> <p>For either x or y correct as a fraction or recurring decimal isw Dep on M2</p> <p>If no more than 1 error in multiplication (either method) follow through for a maximum of 3 marks</p> <p>Condone missing brackets</p> <p>Correct answer with no working scores 4</p>

2		$x = 3 \quad y = -2$	3 B2 for one value correct Or for correct answers reversed OR M1 for equalising x or y coefficients And M1 for correctly adding or subtracting <i>their</i> equations OR M1 for correct rearrangement into $x =$ or $y =$ And M1 for correct substitution	Allow one error or omission Allow one error or omission Allow one error or omission Allow one error or omission
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3	(a)		110	1		
	(b)		$4c + 2m = 378$ $c = 79$ $m = 31$ nfw	1 3	<p>M1 for multiplying one (or both) equation(s) to get either coefficient equal (allow 1 error) eg $4c + 4m = 440$ or $2c + 2m = 220$ $4c + 2m = 378$ or $4c + 2m = 378$</p> <p>M1(dep) for adding or subtracting as appropriate (allow 1 error) eg $2m = 62$ or $2c = 158$</p> <p>Or if substitution used M1 for rearranging to find m or c eg $m = 110 - c$ or (allow 1 error if harder equation used) M1 (dep) for substituting eg $4c + 2(110 - c)$ or better (allow 1 error)</p>	<p>If separate attempts made to eliminate x and y mark to the candidate's benefit</p> <p>Correct m or c with no working implies M2</p> <p>Correct answer with no working scores 3</p>

4	(a)		$5C + 6B = 30$	1	oe eg allow $6B + 5C = 30$	Condone lower case
	(b)		[C =] 3 [B =] 2.50	3	M1 for multiplying one equation to get either coefficient equal (allow 1 error) A1 for either value correct Mark final answer	3 and 2.5 can score up to 2 Correct answer with no working scores 3

5			$x = 1.4 \quad y = -0.3$	3	B2 for one value correct or for answers reversed OR M1 for equalising x or y coefficients M1 for correctly adding or subtracting <i>their</i> equations soi OR M1 for correct rearrangement into $x =$ or $y =$ M1 for correct substitution	Allow one error or omission Allow one error or omission Allow one error or omission Allow one error or omission
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6		$\begin{array}{l} 15x + 10y = 25 \quad \text{or} \quad 9x + 6y = 15 \\ 15x - 9y = 63 \quad \text{or} \quad 10x - 6y = 42 \\ \\ 19y = -38 \quad \text{or} \quad 19x = 57 \\ \\ y = \frac{-38}{19} \quad \text{or} \quad x = \frac{57}{19} \\ \\ x = 3 \\ y = -2 \end{array}$	<p>M1</p> <p>M1dep</p> <p>A1FT</p> <p>A1</p>	<p>For multiplying both equations to make either coefficient equal (allow 1 error) If substitution used M1 for rearranging one equation to get x or y (allow 1 error)</p> <p>For adding or subtracting as appropriate (allow 1 error) M1dep for substitution (allow 1 error)</p> <p>For either x or y correct oe isw</p> <p>Mark final answer</p>	<p>If candidate starts again mark to candidate's advantage</p> <p>Withhold A mark if addition/subtraction leads directly to $\pm x = \dots$, or $\pm y = \dots$</p> <p>Correct answer with no working scores 4</p>
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7	<p>Correct proof well explained and clearly laid out</p> <p>Correct proof well explained with:</p> <ul style="list-style-type: none"> • one reason missing • layout not clear • some use of poor mathematical language • significant errors in spelling, punctuation or grammar <p>Any correct calculation with related reason seen</p> <p>eg Ext angle of pentagon $\frac{360}{5} = 72$ with Exterior angles of a polygon = 360</p> <p>Or any two angles seen from 72, 108, 45, 135, 243, 540, 720, 900, 1080</p> <p>Nothing of any worth.</p>	5	<p>Condone minor errors in spelling, punctuation or grammar</p> <p>4- For lower mark – Correct method leading to 117° with:</p> <ul style="list-style-type: none"> • significant omissions in calculation • more than one reason missing <p>or correct method with one arithmetic error that would lead to answer other than 117°</p> <p>2- For lower mark – Any correct calculation, angle or reason seen.</p> <p>0</p>	<p>Interior angle method</p> <p>Pentagon $180 - \frac{360}{5} = 108$</p> <p>Octagon $180 - \frac{360}{8} = 135$</p> <p>Exterior angles of a polygon (= 360) Angles on a straight line (= 180) $p = 360 - 108 - 135$ $= 117$</p> <p>Angles round a point (= 360)</p> <p>Or $[(n-2) \times 180] \div n$ for $n = 5$ and 8 Then as above</p> <p>Or Listing multiples of 180 Then as above</p> <p>Or Exterior angle method Required angle clearly shown to be the sum of the two ext angles $\frac{360}{5} + \frac{360}{8} = 72 + 45$ $= 117$</p> <p>Exterior angles of a polygon (= 360) If this method not clear here then max 3 marks</p> <p>eg $\frac{360}{5} + \frac{360}{8} = 72 + 45$ gets 3 $= 117$</p>
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8	(a)	$160a + 20c = 6700$ Clear division by 20	1 1	Or $1.6a + 0.2c = 67$ Clear division by 0.2 oe	
	(b)	$c = 15$ with algebraic method	3	M1 for attempt to subtract B1 for $a = 40$	

9		$x^2 - 6x + 7 [= 0]$ or $-x^2 + 6x - 7 [= 0]$ $\frac{6 \pm \sqrt{6^2 - 4 \times 1 \times 7}}{2 \times 1}$ $x = 1.59$ $x = 4.41$ $y = -0.82$ to -0.83 and $y = 4.82$ to 4.83	2 M1 B1 B1 B1 Dep	M1 for eliminating y by equating or subtracting Or fully correct 'complete the square' Condone one error , either method After B0B0 allow SC1 for both values of x from 1.58578...and 4.41421... rot to at least 1 dp Dep on B1B1 or SC1 scored Correctly linked to a value of x	Allow 1 error if subtracting equations <i>Their</i> quadratic, NOT the given one <u>i.e.</u> $x = 1.59$ $y = -0.83$ and $x = 4.41$ $y = 4.83$
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10		$c = 8$ dep on d correct $d = -6$	2 1	<p>M1 for $2c + d = 10$ or $2c - 6 = 10$ or FT <i>their d</i></p> <p>Condone answers reversed on answer line if clearly correct in body of script</p> <p>SC2 for answers reversed on answer line with no working</p>	
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11		$x = -1$ oe $y = 5$ nfw	3	<p>M1 for multiplying one (or both) equation(s) to get either coefficient equal (allow 1 error) eg $x + 3y = 14$ $2x + 6y = 28$ $6x + 3y = 9$ or $2x + y = 3$</p> <p>A1FT for either x or y correct oe isw $y = 5$ or $x = -1$</p> <p>Or if substitution used M1 for rearranging and attempt at substituting eg $x + 3(3 - 2x) = 14$ or $2(14 - 3y) + y = 3$ or better (allow 1 error) then A mark as above</p>	<p>If no more than 1 error in multiplication (and no errors in addition/subtraction) follow through for a maximum of 2 marks</p> <p>If separate attempts made to eliminate x and y mark to the candidate's benefit Allow FT if exact or correct to at least 2sf</p> <p>Correct x or y with no working implies M1A1</p> <p>Correct answer with no working scores 3</p>
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Question	Answer	Marks	Part Marks and Guidance	
12	Attempt to equate or subtract $x^2 + 4x - 12 [= 0]$ $(x + 6)(x - 2)$ $x = -6$ and $x = 2$ $y = -5$ and $y = 11$	M1 A1 M2FT B1 B1	Mark best attempt <u>FT for <i>their</i> 3 term quadratic – not the original</u> $\frac{-4 \pm \sqrt{4^2 - 4 \times 1 \times -12}}{2 \times 1}$ Or for $-2 \pm \sqrt{16}$ oe Or M1FT for $(x \pm 6)(x \pm 2)$ seen or for $4^2 - 4 \times 1 \times -12$ seen or for $(x + 2)^2 - 4 - 12 [=0]$ <u>After B0</u> SC1 for one correct x,y pair	
			Attempt to rearrange for y and sub $y^2 - 6y - 55 [=0]$ $(y - 11)(y + 5)$ $y = -5$ and $y = 11$ $x = -6$ and $x = 2$	

