

1	(c)(i)	$(y \pm 6)(y \pm 8)$		2	M1
			$(y - 8)(y + 6)$		A1
	(c)(ii)		8, -6	1	B1 must fit from their factors in (c)(i)

2		$(x \pm 9)(x \pm 4)$	$\frac{-(-5) \pm \sqrt{(-5)^2 - 4 \times 1 \times (-36)}}{2 \times 1}$ or $\frac{5 \pm \sqrt{25 + 144}}{2}$		M1 or $(x + a)(x + b)$ where $ab = -36$ or $a + b = -5$ OR correct substitution into quadratic formula (condone one sign error in a , b or c) (if + rather than \pm shown then award M1 only unless recovered with answers)
		$(x - 9)(x + 4)$	$\frac{5 \pm \sqrt{169}}{2}$ or $\frac{5 \pm 13}{2}$		M1 or $\frac{5 \pm \sqrt{169}}{2}$ or $\frac{5 \pm 13}{2}$
			9, -4	3	A1 dep on at least M1
Total 3 marks					

3	(b)	$(x \pm 8)(x \pm 5)$	$\frac{-(-3) \pm \sqrt{(-3)^2 - 4 \times 1 \times (-40)}}{2 \times 1}$ or $\frac{3 \pm \sqrt{9 + 160}}{2}$		M1 or $(x + a)(x + b)$ where $ab = -40$ or $a + b = -3$ OR correct substitution into quadratic formula (condone one sign error in a , b or c and missing brackets) (if + rather than \pm shown then award M1 only unless recovered with answers)
		$(x - 8)(x + 5)$	$\frac{3 \pm \sqrt{169}}{2}$ or $\frac{3 \pm 13}{2}$		M1 $\frac{3 \pm \sqrt{169}}{2}$ or $\frac{3 \pm 13}{2}$
			8, -5	3	A1 dep on at least M1 for correct values

4	(i)	$(x \pm 6)(x \pm 4)$		2	M1 or $(x + a)(x + b)$ where $ab = -24$ or $a + b = 2$
		<i>Working not required, so correct answer scores full marks</i>	$(x + 6)(x - 4)$		A1
	(ii)	<i>Answer must come from the factors in (i) as the questions says 'Hence solve...'</i>	-6, 4	1	B1 Must follow through from their factors in (i), so even if the answers 8 and -6 are given, the mark can only be awarded if it follows from the factorisation in (i) (dep on 2 factors)
Total 3 marks					
					NB: Some students may show the whole of their working in the space for (i) or (ii). Please award the marks for (i) and (ii) so long as there is no ambiguity.

5		eg $(x \pm 20)(x \pm 1)$	$\frac{-(-21) \pm \sqrt{(-21)^2 - 4 \times 1 \times 20}}{2 \times 1}$ or $\left(x - \frac{21}{2}\right)^2 - \left(\frac{21}{2}\right)^2 + 20 = 0$	3	M1 If factorising, allow brackets which expanded give 2 out of 3 terms correct – if using formula or completing the square allow one sign error and some simplification – allow as far as eg $\frac{21 \pm \sqrt{441 - 80}}{2}$ or e $\left(x - \frac{21}{2}\right)^2 - \frac{361}{4} = 0$ oe
		$(x - 20)(x - 1)$	eg $\frac{21 \pm \sqrt{441 - 80}}{2}$ or $\frac{21 \pm \sqrt{361}}{2}$ or $\frac{21 \pm 19}{2}$ or $x = \pm \sqrt{\frac{361}{4}} + \frac{21}{2}$ oe		M1 dep on M1 for correct factorisation, or a correct expression for x if completing the square, or a correct substitution into quadratic formula with some processing.
			1, 20		A1 for both correct values, dep on 1st M1 with no incorrect working.
Total 3 marks					

6	(b)(i)	$(x \pm 9)(x \pm 4)$		2	M1 for $(x \pm 9)(x \pm 4)$ or for $(x + a)(x + b)$ where $ab = -36$ or $a + b = 5$
			$(x + 9)(x - 4)$		A1
	(ii)		-9, 4	1	B1 fit from (b)(i)

7	(b)(i)			2	M1 for $(x \pm 9)(x \pm 1)$ or for $(x + a)(x + b)$ with $ab = -9$ or $a + b = 8$
			$(x + 9)(x - 1)$		A1 for correct factors
	(ii)		-9, 1	1	B1 fit dep on factorising in the form $(x + p)(x + q)$

8	(i)	$(x \pm 3)(x \pm 8)$		2	M1	or $(x + a)(x + b)$ where $ab = -24$ or $a + b = 5$
			$(x - 3)(x + 8)$		A1	
	(ii)		3, -8	1	B1ft	Must fit from their answer to (i) fit from their incorrect factors in the form $(x + a)(x + b)$
						Total 3 marks

9	(a)	$5x \leq 2 + 7$ or $5x \leq 9$ or $\frac{5x}{5} - \frac{7}{5} \leq \frac{2}{5}$ oe		2	M1	allow any sign instead of \leq or for an answer of 1.8 oe or x and 1.8 oe with the incorrect sign
					A1	oe
	(b)(i)	$(y \pm 7)(y \pm 5)$	$x \leq 1.8$	2	M1	for $(y \pm 7)(y \pm 5)$ or $(y + a)(y + b)$ where $ab = -35$ or $a + b = -2$
			$(y - 7)(y + 5)$		A1	isw if student goes on to solve the equation in this part
	(ii)		7, -5	1	B1ft	answer must fit from their $(y + a)(y + b)$ in (b)(i). Award B0 for 7, -5 if no marks scored in (i)
						Total 5 marks

10	(a)		$3c^2(6cd^2 - 7)$	2	B2	fully correct or B1 for a correct partial factorisation with at least two terms outside the bracket ie $3c(6c^2d^2 - 7c)$ or $c^2(18cd^2 - 21)$ or the fully correct factor outside the bracket with two terms inside the bracket and at most one mistake $3c^2(\dots\dots\dots)$
	(b) (i)	eg $(y \pm 6)(y \pm 3)$ or $y(y + 3) - 6(y + 3)$ or $y(y - 6) + 3(y - 6)$		2	M1	or $(y + a)(y + b)$ where $ab = -18$ or $a + b = -3$ or factorisation which expands to give 2 out of 3 correct terms
		[allow use of x rather than y]	$(y - 6)(y + 3)$		A1	
	(ii)		6, -3	1	B1	ft must come from their factors in (b)(i)
Total 5 marks						