1	(a)			2	M1	for $(x \pm 6)(x \pm 7)$
			$(x + 6)(x - 7)$		A1	for $(x + 6)(x - 7)$ or $(x - 7)(x + 6)$ isw roots given if candidate solves the quadratic = 0

2	(b)			2	M1	for any **correct** partial factorisation with at least 2 factors, one of which must be a letter **or** the correct common factor with no more than 1 error inside the bracket
			$8m^2 g^3(2m + 3g^2)$		A1	
	(c)(i)	$(y \pm 6)(y \pm 8)$		2	M1	
			$(y - 8)(y + 6)$		A1	
	(c)(ii)		$8, -6$	1	B1	**must** ft from their factors in (c)(i)

3	b		$3f(3e - 4)$	2	B2	(B1 for $3(3ef - 4f)$ or $f(9e - 12)$ or $3f(ke - 4)$ or $3f(3e - m)$ where $k \neq 0$ and $m \neq 0$)

4	(b)		$5y(1 + 4y)$	2	B2	If not B2 then award B1 for $5(y + 4y^2)$ **or** $y(5 + 20y)$ **or** $5y(a + 4y)$ where a is an integer and $a \neq 0$ **or** $5y(1 + by)$ where b is an integer and $b \neq 0$

5	(a)		$5a^4c^3(5c^4d + 9a^5h)$	2	B2	If not B2 then award B1 for any **correct** factorisation with at least 2 of: the 5, a term in a, a term in c, outside the bracket eg $5ac(5a^3c^6d + 9a^8c^2h)$ **or** $a^2c(25a^2c^6d + 45a^7c^2h)$ (NB: not just a^4 etc as we want to know students have considered more than just one letter or the number) **or** the correct common factor **and** a 2 term expression inside the bracket eg $5a^4c^3(5c^4 + 9a^5)$ (this is missing d in first term and h in the second but the common factor is correct)

6	(i)	$(x \pm 6)(x \pm 4)$		2	M1	or $(x + a)(x + b)$ where $ab = -24$ **or** $a + b = 2$
		Working not required, so correct answer scores full marks	$(x + 6)(x - 4)$		A1	
	(ii)	*Answer must come from the factors in (i) as the questions says 'Hence solve…'*	$-6, 4$	1	B1ft	**Must** follow through from their factors in (i), so even if the answers 4 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.

7	c	$(x \pm 3)(x \pm 8)$		2	M1	or for $(x \pm a)(x \pm b)$ where $ab = 24$ or $a + b = -11$
			$(x - 3)(x - 8)$		A1	

8	(b)		$2p(4p - 1)$	2	B2	B1 for $p(8p - 2)$ or $2(4p^2 - p)$ or $2p(4p - 1)$ with two terms inside the bracket with one term correct.

9	(a)		$5y^3(3y + 4u)$	2	B2	for $5y^3(3y + 4u)$
					(B1	for $5y(3y^3 + 4uy^2)$ **or** $5y^2(3y^2 + 4uy)$ **or** $y^2(15y^2 + 20uy)$ **or** $y^3(15y + 20u)$ **or** $5y^3(…)$ where there is only one mistake in the brackets)

10	(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	ft from (b)(i)

11	(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	ft dep on factorising in the form $(x + p)(x + q)$

| 12 | (d) | | $5cd^2(2c^2 + 3d^2)$ | 2 | B2 | for $5cd^2(2c^2 + 3d^2)$ |

B1 for a correct partial factorisation eg $5(2c^3d^2 + 3cd^4)$ or $cd^2(10c^2 + 15d^2)$ **or** $5d^2(2c^3 + 3cd^2)$ **or** $5c(2c^2d^2 + 3d^4)$ $5cd(2c^2d + 3d^3)$ etc or $5cd^2$(a 2 term expression with just one error)

| 13 | (a) | $(3x \pm 2y)(3x \pm 2y)$ or $(3x)^2 - (2y)^2$ | | 2 | M1 | |
| | | | $(3x + 2y)(3x - 2y)$ | | A1 | |

14	(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 ft from their answer to (i) ft from their incorrect factors in the form $(x + a)(x + b)$
						Total 3 marks

| 15 | (c) | $(n \pm 3)(n \pm 4)$ | | 2 | M1 | for $(n \pm 3)(n \pm 4)$ or $(n + a)(n + b)$ where $ab = 12$ or $a + b = -7$ Condone use of a different letter to n |
| | | | $(n - 3)(n - 4)$ | | A1 | |

16	(b)(i)	$(y \pm 7)(y \pm 5)$		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 ft from their $(y + a)(y + b)$ in (b)(i). Award B0 for 7, −5 if no marks scored in (i)

| 17 | (b) | | $5b^3c(3b^2 - 7c^8)$ | 2 | B2 | fully correct **or** B1 for a correct partial factorisation with at least two terms outside the bracket eg $5b^3(3b^2c - 7c^9)$ or $5c(3b^5 - 7b^3c^8)$ etc **or** the fully correct factor outside the bracket with a two term expression in terms of b and c inside the bracket eg $5b^3c(15b^2 - c^8)$ |

18	(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 $3c^2(............)$
	(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

18(b) As we have always done, (ii) must ft from (i)
If they do nothing in (i) and then factorise and give the solutions in (ii) can we give marks retrospectively – yes, as long as nothing in (i) – this could gain M1A1B1 (correct factorisation and correct solutions) or M1A0B1 (factorisation worthy of the method mark, but not correct and ft solutions from incorrect factorisation) or M0A0B1 (incorrect factorisation that is worthy of no marks and then answers which ft from their incorrect factorisation)
What do we do if they give the incorrect factorisation in (i) and then start again in (ii), showing the correct factors and give the correct answers from their factorisation in (ii) as answers? Award M0A0 in (i) and then B1 in (ii)
What do we do if nothing is done in (i) and then we see they have used the quadratic formula and got the answers from this in (ii)? No marks at all M0A0B0
What do we do if the student has got the correct factorisation in (i) and the correct answers in (ii) but also has the quadratic formula shown in (ii)? We award M1A1B1 – assuming that the quadratic formula is a check
What if they factorise and solve in part (i) with nothing in (ii)
M1A1B1 if fully correct or M1A0B1(allowable factorisation) or M0A0B1 (ft from incorrect factorisation that is not allowable)
What if they factorise in (i) and give the correct answers for (ii) in (i) and then a different answer for the solution in (ii)
Award M1A1 in (i) and B0 in (ii)
What if they factorise correctly and then expand and give the original expression on the answer line – award full marks; the student knows how to factorise and is checking and gives their check as the answer.

19	(a)	$(y\pm 6)(y\pm 8)$ or $y(y+6)-8(y+6)$ or $y(y-8)+6(y-8)$		2	M1 or for $(y\pm a)(y\pm b)$ where $ab=-48$ or $a+b=-2$
			$(y+6)(y-8)$		A1 oe Allow any letter for y

20	(c)		$7x^2y^2(2y^2+3x)$	2	B2	B1 for a correct factorisation with at least 2 factors outside (eg $7x$, x^2, xy, etc) eg $7x(2xy^4+3x^2y^2)$ eg $x^2y^2(14y^2+21x)$ or for the correct common factor with just one mistake inside the bracket eg $7x^2y^2(2y+3x)$ which is missing the squared on the y term

21	(b)	$(y\pm 5)(y\pm 4)$ or $(5\pm y)(4\pm y)$ or $y(y-4)-5(y-4)$ or $y(y-5)-4(y-5)$		2	M1	for $(y\pm 5)(y\pm 4)$ **or** $(5\pm y)(4\pm y)$ **or** for $(y+a)(y+b)$ where $ab=20$ or $a+b=-9$
		Correct answer scores full marks (unless from obvious incorrect working)	$(y-5)(y-4)$		A1	oe Allow any letter for y Accept $(5-y)(4-y)$

22	(c)		$4a^2b(4b^2+5a)$	2	B2	B1 for any correct partial factorisation with at least 2 factors, **or** the correct common factor with no more than 1 error inside the bracket
	(d)(i)	$(x\pm 11)(x\pm 2)$		2	M1	for $(x\pm 11)(x\pm 2)$ **or** for $(x+a)(x+b)$ with $ab=-22$ or $a+b=9$
		Correct answer scores full marks (unless from obvious incorrect working)	$(x+11)(x-2)$		A1	for correct factors
	(ii)		$-11, 2$	1	B1ft	ft dep on factorising in the form $(x+p)(x+q)$

23		$2(5g + 3)(5g − 3)$	3	B3	for $2(5g + 3)(5g − 3)$
				B2	for $2(5g ± 3)(5g ± 3)$ oe eg $2(5g − 3)^2$
				B1	for $2(25g^2 − 9)$ **or** $(10g + 6)(5g − 3)$ **or** $(5g + 3)(10g − 6)$ **or** $(5g + 3)(5g − 3)$
					Total 3 marks