Q1.   (a)   Expand and simplify $(y + 2)(y + 3)$

....

(2)

(b)   Simplify $\dfrac{3(x-2)}{x^2 - 7x + 10}$

....

(2)
(Total 4 marks)

Q2.   (a)   Expand and simplify $2(x + 3) + 3(x + 6)$

....

(2)

(b)   Factorise completely $3y^2 - 12y$

....

(2)

(c)   Factorise $t^2 - 16$

....

(1)
(Total 5 marks)

Q3.   (a)   Simplify $4b \times 2c$

....

(1)

(b)   Expand $3(2w - 5t)$

....

(2)

(c)   Expand and simplify $(x + 7)(x - 2)$

....

(2)
(Total 5 marks)

Q4.   (a)   Expand $3(x + 2)$

....
(2)

(b)   Factorise completely $12x^3y - 18\,xy^2$

....
(2)

(c)   Expand and simplify $(2x - 3)(x + 4)$

....
(2)

(d)   Simplify $5x^4y^3 \times 2x^3y^2$

....
(2)
(Total 8 marks)

Q5.   (a)   Factorise fully $6x^2 + 9xy$

....
(2)

(b)   Expand and simplify $(2x + 5)(x – 2)$

....
(2)
(Total 4 marks)

Q6.   (a)   Simplify

(i) $a^5 \div a^3$

....

(ii) $2x^2 \times 3x^2y^2$

....
(3)

(b)   Expand and simplify $(x + 3)(x + 7)$

....

(2)

(c)   Factorise fully $3pq - 12p^2$

....

(2)

(d)   (i)   Factorise $3y^2 - 10y + 3$

....

Hence, or otherwise

(ii)   Factorise $3(x + 2)^2 - 10(x + 2) + 3$

....

(4)
(Total 11 marks)

M1.

	Working	**Answer**	**Mark**	**Additional Guidance**
(a)	$y^2 + 3y + 2y + 6$	$y^2 + 5y + 6$	2	**M1** for 3 terms out of y^2, $3y$, $2y$, 6 or $y^2 + 5y (+ c)$ or $(dy^2 +)5y + 6$ **A1** for $y^2 + 5y + 6$
(b)	$\dfrac{3(x-2)}{(x-2)(x-5)}$	$\dfrac{3}{x-5}$	2	**M1** for $(x \pm 2)(x \pm 5)$ **A1** cao
				Total for Question: 4 marks

M2.

	Working	**Answer**	**Mark**	**Additional Guidance**
(a)	$2x + 6 + 3x + 18$	$5x + 24$	2	**M1** for $2 \times x + 2 \times 3$ or for $3 \times x + 3 \times 6$ **A1** for $5x + 24$ cao
(b)		$3y(y - 4)$	2	**M1** for $3y(ay - b)$ or for $3(ay^2 - by)$ or for $y(3y - 12)$ **A1** for $3y(y - 4)$ cao
(c)		$(t - 4)(t + 4)$	1	**B1** for $(t - 4)(t + 4)$ oe
				Total for Question: 5 marks

M3.

	Working	Answer	Mark	Additional Guidance
(a)		$8bc$	1	**B1** cao
(b)		$6w - 15t$	2	**M1** for $3 \times 2w - 3 \times 5t$ or $6w$ or $-15t$ **A1** cao
(c)	$x^2 + -2x + 7x - 14$	$x^2 + 5x - 14$	2	**M1** for all 4 terms correct with or without signs **or** 3 out of no more than four terms correct with signs **or** $x(x - 2) + 7(x - 2)$ **or** $x(x + 7) - 2(x + 7)$ **A1** cao
				Total for Question: 5 marks

M4.

	Working	Answer	Mark	Additional Guidance
(a)		$3x + 6$	2	**M1** for attempted expansion of the bracket eg $3 \times x$ and 3×2 seen or $3x + k$ or $kx + 6$ **A1** for $3x + 6$
(b)		$6xy(2x^2 - 3y)$	2	**M1** or $6xy$ (two terms involving x and/or y) or correct partial factorisation by taking out two from 6 (or 3 or 2) or x or y **A1** cao
(c)	$2x^2 + 8x - 3x - 12$	$2x^2 + 5x - 12$	2	**M1** for 3 out of 4 correct terms with correct signs, or all 4 terms ignoring signs **A1** cao
(d)		$10x^7y^5$	2	**B2** for $10x^7y^5$ (**B1** for product of two of 5×2 oe, x^{4+3}, y^{3+2} ignore × signs)
				Total for Question: 8 marks

M5.

	Working	Answer	Mark	Additional Guidance
(a)		$3x(2x + 3y)$	2	**B2** for fully correct (accept $(3x - 0)(2x + 3y)$ (**B1** for $x(6x + 9y)$ or $3(2x^2 + 3xy)$ or $3x$(a linear expression in x and y)
(b)	$2x^2 - 4x + 5x - 10$	$2x^2 + x - 10$	2	**B2** for $2x^2 + x - 10$ (**B1** for 3 out of 4 terms correct, with correct signs, or the 4 terms $2x^2$, $4x$, $5x$ and 10 seen, ignoring signs)
				Total for Question: 4 marks

M6.

	Working	Answer	Mark	Additional Guidance
(a)		a^2 $6x^4y^3$	3	**B1** cao **B2** $6x^4y^3$ (B1 for 2 out of 3 terms correct in a product)
(b)	$x^2 + 3x + 7x + 21$	$x^2 + 10x + 21$	2	**M1** 3 or 4 terms out of 4 correct in a 4 term expansion **A1** cao
(c)		$3p(q - 4p)$	2	**B2** cao (B1 $p(3q - 12p)$, $12p(\frac{1}{4}q - p)$,

				$p(aq + bp)$ where a and b are numbers)
(d)(i)	$(3(x + 2) - 1)(x + 2 - 3)$	$(3y - 1)(y - 3)$	4	**B2** cao (B1 $(3y - m)(y - n)$ where $mn = \pm3$ or $m + n = \pm10$
(ii)	**OR** $3x^2 + 12x + 12 - 10x - 20 + 3$ $= 3x^2 + 2x - 5$	$(3x + 5)(x - 1)$		**M1** use of the factorised form with y replaced twice by $3x + 2$ **A1** cao **OR** **B1** $3x^2 + 2x - 5$ **B1** cao

Total for Question: 11 marks

E1.   A variety of methods were used by candidates when answering the first part of the question. Almost 80% of answers seen gained at least one mark for writing down 3 or more correct terms in the expansion. A common error from those who did not score full marks for this part of the question was to add rather than multiply the constant terms. In part (b) partial credit was given to candidates who made a good attempt at factorising the denominator of the fraction. Some candidates multiplied out the numerator and tried to factorise the denominator (sometimes successfully) and hence failed to simplify the fraction. Clearly, for some candidates this material was unfamiliar territory. About one quarter of candidates completed this part successfully.

E2.   This question was poorly answered overall. Part (a) was the most successful with almost all candidates gaining at least one mark for multiplying out one of the brackets. About a third of the candidates gained a mark in (b) for a partial factorisation of the expression but fully correct solutions were rare. In part (c) only about 10% of candidates gave the correct answer for the factorisation of the difference of two squares.

##

Part A was successfully answered with the most common error caused by an arithmetical slip with the numerical terms 4 and 2 most notably leading to $6bc$ rather than $8bc$. Part (b) was generally well done. The main errors involved combining $6w$ and $-15t$ terms to give $-9wt$ or writing $6w - 5t$ on the answer line even if $6w - 15t$ was seen in the working space.

Most candidates were able to score at least 1 mark on part (c). Clear working was often presented in a grid or table and this helped ensure that candidates found all 4 terms. Errors occurred dealing with the $-2x$ term when simplifying and $-2x + 5x$ led to either or $9x$ or $-5x$.

##

Multiplying the first term in the bracket only and leaving the second unchanged, ie $3x + 2$, was the most common incorrect answer and $3x + 5$ was often seen. A few did not score the final accuracy mark by continuing to 'simplify' their final answer, writing $3x + 6 = 9x$. Very few answers reflected no understanding of the algebra involved.

In part (b) most students found some common factors and divided well. Candidates need to ensure that they find the highest common factor, particularly for the number part of each term. They need to look at the terms left in the bracket to see if anything is still a factor. Candidates should be encouraged to check their answer by expanding as answers such as $6xy(2x^2 - 3xy)$ were occasionally seen.

In part (c) This question was well answered with a majority of candidates familiar with the need to find four terms and many also correctly dealing with the signs and simplification of the answer. 43% of candidates could expand and simplify correctly with a further 24% able to provide 4 correct terms (ignoring the signs) or 3 correct terms with the correct signs. The most common errors were incorrect signs, incorrect product of $2x$ and x, an incorrect simplification of $-3x + 8x$ or a constant term of +1 In part (d) it was pleasing to see that nearly 60% of the candidates obtained the correct answer with a further 12% scoring one mark for obtaining 2 correct parts of the expression $10x^7y^5$. The most common error was to add the coefficients with $7\ x^7y^5$ frequently seen. Others left multiplication signs in their answer or occasionally an addition sign.

E5.   Many candidates failed to factorise the given expression fully and answers of $3(2x^2 + 3xy)$, and $x(6x + 9y)$ were common. Some candidates, understanding something of the concept of factorisation, took 6 or 6x as a common factor giving answers of $6x(x + 1.5y)$ or $6x(x + 9y)$. These gained no marks.

In part (b), sign errors often resulted in candidates losing one of the two marks. The most common incorrect answers were $2x^2 + 9x \pm 10$ and $2x^2 + x \pm 7$ (or ±3), usually after one mark had been awarded. A significant number of candidates had no idea how to expand the brackets giving answers of for example, $2x^2 \pm 10$