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)   Factorise $x^2 - y^2$.

....

(1)

Hence, or otherwise,

(b)   factorise $(x + 1)^2 - (y + 1)^2$.

....

(2)

Q4.   (a)   Factorise fully $20w^2y + 24wy^3$

....
(2)

(b)   Factorise $m^2 + 3m - 40$

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

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

....
(2)

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

....

(2)
(Total 4 marks)

Q6. (a) Factorise fully $4x^2 - 6xy$

....

(2)

(b) Factorise $x^2 + 5x - 6$

....

(2)
(Total 4 marks)

Q7. Simplify $\dfrac{3x^2 - 16x - 35}{9x^2 - 25}$

....

(Total 3 marks)

Q8.   (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)		$(x + y)(x - y)$	1	**B1** cao
(b)	$((x + 1) - (y + 1)) \times$ $((x + 1) + (y + 1))$ $x^2 + 2x + 1 - (y^2 + 2y + 1)$ $= x^2 - y^2 + 2x - 2y$ $= (x - y)(x + y) + 2(x - y)$	$(x - y)(x + y + 2)$	2	**M1** for attempt to replace x by $(x + 1)$ and y by $(y + 1)$ **A1** cao **Alternative** **M1** for expanding both brackets to get $x^2 + 2x + 1$ **and** $y^2 + 2y + 1$ **A1** cao
				Total for Question: 3 marks

M4.

	Answer	Mark	Additional Guidance
(a)	$4wy(5w + 6y^2)$	2	**M1** for a correct factor taken outside the brackets Or $4wy$(a 2 term expression in w and y, with just one error) **A1** cao
(b)	$(m + 8)(m - 5)$	2	**M1** for $(m \pm 8)(m \pm 5)$ **A1** cao
			Total for Question: 4 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)		$2x(2x - 3y)$	2	**B2** **(B1** for $x(4x - 6y)$ or $2(2x^2 - 3xy)$ or $2x$ (two terms) or $4x(x - 1.5y)$)
(b)	$x^2 - x + 6x - 6 = x(x - 1) + 6(x - 1)$	$(x + 6)(x - 1)$	2	**B2** cao **(B1** $(x - 6)(x + 1)$ or $(x - 6)(x - 1)$ or $x(x - 1) + 6(x - 1)$ or $x(x + 6) - (x + 6)$)
				Total for Question: 4 marks

M7.

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Working	Answer	Mark	Additional Guidance
$\dfrac{(3x+5)(x-7)}{(3x-5)(3x+5)}$	$\dfrac{x-7}{(3x-5)}$	3	**B1** $(3x+5)(x-7)$ **B1** $(3x-5)(3x+5)$

Total for Question: 3 marks

M8.

	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) (ii)	$(3(x + 2) - 1)(x + 2 - 3)$ **OR** $3x^2 + 12x + 12 - 10x - 20 + 3$ $= 3x^2 + 2x - 5$	$(3y - 1)(y - 3)$ $(3x + 5)(x - 1)$	4	**B2** cao (B1 *(3y − m)(y − n)* where $mn = \pm3$ or $m + n = \pm10$ **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.

E3. This question was poorly answered with 62% of candidates gaining no marks at all. Only 0.4% of candidates gained all three marks for a fully correct solution with 25% gaining one mark either for multiplying out both $(x + 1)^2$ and $(y + 1)^2$ correctly or for correctly factorising $x^2 - y^2$.

The remaining 13% of candidates gained two marks, usually for obtaining the correct answer to (a) and squaring the two brackets in (b). Very few candidates linked the two parts of the question and the hint in the question of "Hence" was ignored by all but the most able candidates. Here again presentation of clear logical steps was often sadly lacking with candidates work arranged often in random order.

##

Candidates found part (a) quite challenging. There were a variety of partially factorised answers were given along with some which had correctly identified the 4wy factor but incorrectly dealt one of the terms inside the bracket. In both these cases a single mark was awarded.

In part (b) the incorrect answer m(m + 3) + 40 was often seen. A few used 2 pairs of brackets but the wrong factor pair, typically 4 and 10 but a mark was awarded where the only error was with signs giving (m-8)(m+5). Candidates could be encouraged to multiply out their brackets as a final check – there was little evidence of this taking place.

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, $2x^2 \pm 10$

E6.   It is encouraging that many candidates were able to recognise different types of factorisation and distinguish between the type involving common factors and the type which needs two brackets.

The majority of candidates demonstrated knowledge of factorisation in part (a) although a number did not fully factorise the expression.

Partial factorisations such as $2(2x^2 – 3xy)$ and $x(4x – 6y)$ were quite common. Some candidates identified $2x$ as the common factor but made a mistake inside the brackets, e.g. writing $2x(x – 3y)$. In part (b) many candidates attempted to factorise into two brackets, although a large proportion did not find two numbers which both multiplied to give –6 and added to give +5. Many found numbers which satisfied one condition or the other, but not both, e.g. 2 and 3.