Q1. (a) Expand $3(x + 2)$

.....

(2)

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

.....

(2)

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

.....

(2)

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

.....

(2)
(Total 8 marks)

Q2. (a) Simplify fully $(x^3)^{\frac{1}{2}} \times (x^2)^{\frac{1}{4}}$

.....

(3)

(b) Solve $(x - 1)(x + 2) = 18$

.....

(4)

(c) Solve the simultaneous equations

$y = x^2 - 1$

$y = 5 - x$

.....

.....

(5)

(Total 12 marks)

Q3. (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)		$3x + 6$	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

M2.

	Working	Answer	Mark	Additional Guidance
(a)	$x^{3/2} \times x^{1/2}$	x^2	3	**B1** $x^{3/2}$ seen **B1** $x^{1/2}$ oe seen **A1** cao
(b)	$x^2 - 1x + 2x - 2 = 18$ $x^2 + x - 20 = 0$ $(x + 5)(x - 4)$	4, –5	4	**M1** Correct expantion **B1** $x^2 + x - 20 = 0$ **B1** $(x + 5)(x - 4)$

				A1 cao
(c)	$x^2 + x - 6 = 0$ $(x + 3)(x - 2)$ $x = -3$, $x = 2$	$x = -3$, $y = 8$ $x = 2$, $y = 3$	5	**M1** Sets equations equal and rearranges **B1** $x^2 + x - 6 = 0$ **B1** $(x - 3)(x + 2)$ **A2** Two correct pair of sollutions **A1** correct set of x values
				Total for Question: 12 marks

M3.

	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 $mn = \pm 3$ or $m + n = \pm 10$
(ii)	**OR**	$(3x + 5)(x - 1)$		**M1** use of the factorised form with y replaced twice by $3x + 2$

	$3x^2 + 12x + 12 - 10x - 20 + 3$ $= 3x^2 + 2x - 5$			**A1** cao **OR** **B1** $3x^2 + 2x - 5$ **B1** cao
				Total for Question: 11 marks

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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.