Q1. (a) Simplify

$8e - 3f - e - 3f$

.....

(2)

(b) Expand

$2(3c - 2)$

.....

(1)

(c) Factorise

$xy + 3x$

.....

(1)
(Total 4 marks)

Q2. (a) Expand

$2(3c - 2)$

.....

(1)

(b) Factorise

$xy + 3x$

.....

(1)
(Total 2 marks)

Q3. (a) Simplify fully $3x + 5y + 2x - 6y$

.....

(2)

(b) Simplify fully $\frac{2x}{4xy}$

.....

(2)

(c) Expand and simplify $\frac{1}{2}(2x - 6)$

.....

(1)
(Total 5 marks)

Q4. Expand and simplify $(x + 4)(x – 3)$

.....

(Total 2 marks)

Q5. (a) Factorise $5x + 10$

.....

(1)

(b) Expand and simplify $(x – 3)(x + 5)$

.....

(2)
(Total 3 marks)

Q6. (a) Expand and simplify $4(2x + 5) + 2(3x – 2)$.

.....

(2)

(b) Expand and simplify $(x + 5)(x + 8)$.

.....

(2)
(Total 4 marks)

Q7. (a) Expand and simplify $3(2x + 3) + 2(x + 1)$.

.....

(2)

(b) Expand and simplify $(y - 3)(y + 4)$.

.....

(2)
(Total 4 marks)

Q8. (a) Factorise fully $8p^2q + 12p$

.....

(2)

(b) Expand and simplify $5 - 2(m - 3)$

.....

(2)
(Total 4 marks)

Q9. (a) Simplify $4a + 3c - 2a + c$

.....

(1)

(b) $S = \frac{1}{2}at^2$

Find the value of S when $t = 3$ and $a = \frac{1}{4}$

S = ...

(2)

(c) Factorise $x^2 - 5x$

.....

(2)

(d) Expand and simplify $(x + 3)(x + 4)$

.....

(2)

(e) Factorise $y^2 + 8y + 15$

.....

(2)
(Total 9 marks)

Q10. (a) Expand $x(3x - 5y)$

.....

(2)

(b) Factorise $x^2 - 36$

.....

(1)
(Total 3 marks)

Q11. (a) Simplify $4p \times 5q$

.....

(1)

(b) Simplify $d \times d \times d \times d$

.....

(1)

(c) Expand $4(3a - 7)$

.....

(2)

(d) Expand and simplify $2(2n + 3) + 3(n + 1)$

.....

(2)

(e) Simplify $t \times t^2$

.....

(1)

(f) Simplify $m^5 \div m^3$

.....

(1)
(Total 8 marks)

Q12. (a) Expand and simplify $3(x + 4) + 5(2x + 1)$

.....

(2)

(b) Simplify $t^4 \times t^6$

.....

(1)

(c) Simplify $p^8 \div p^5$

.....

(1)

(d) Simplify $(x^4)^3$

.....

(1)
(Total 5 marks)

Q13. (a) Expand $4(x - 3)$

.....

(1)

(b) Solve $4t + 1 = 19$

t = ...

(2)
(Total 3 marks)

Q14. (a) Simplify $a \times a \times a$

.....

(1)

(b) Expand $5(3x - 2)$

.....

(1)

(c) Expand $3y(y + 4)$

.....

(2)

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

.....

(2)

(e) Expand and simplify $(x + 4)(x - 3)$

.....

(2)
(Total 8 marks)

Q15. (a) Solve $5p - 16 = 4$

p = ...

(2)

(b) Solve $2q - 4 = 5q + 5$

q = ...

(2)

$y = 3(2x - 1) - 2(5 + 3x)$

(c) Find the value of y.

y = ...

(2)
(Total 6 marks)

M1.

	Answer	Mark	Additional Guidance
(a)	$7e - 6f$	2	**B2** (**B1** for $7e$ or $-6f$ seen)
(b)	$6c - 4$	1	**B1** (accept $6 \times c - 4$, $c6 - 4$ or equivalent expansion)
(c)	$x(y + 3)$	1	**B1**
			Total for Question: 4 marks

M2.

	Answer	Mark	Additional Guidance
(a)	$6c - 4$	1	**B1** oe
(b)	$x(y + 3)$	1	**B1** for $x(y + 3)$ oe or $(x + 0)(y + 3)$ oe
			Total for Question: 2 marks

M3.

	Answer	Mark	Additional Guidance

(a)	$5x - y$	2	**B2** for $5x - y$ cao (**B1** for $5x + ny$ or for $nx - y$)
(b)	$\frac{1}{2y}$	2	**B2** for $\frac{1}{2y}$ cao (**B1** for $\frac{2}{4y}$ or for $\frac{x}{2xy}$)
(c)	$x - 3$	1	**B1** for $x - 3$ cao
			Total for Question: 5 marks

M4.

Working	Answer	Mark	Additional Guidance
$x^2 - 3x + 4x - 12$	$x^2 + x - 12$	2	**M1** for any three of x^2, $-3x$, $4x$, -12 **A1** for $x^2 + x - 12$ cao
			Total for Question: 2 marks

M5.

	Working	Answer	Mark	Additional Guidance
(a)		$5(x + 2)$	1	**B1**
(b)	$(x - 3)(x + 5)$ $x^2 - 3x + 5x - 15$	$x^2 + 2x - 15$	2	**M1** for 3 out of 4 terms of x^2, $-3x$, $5x$, -15 correct **A1** for $x^2 + 2x - 15$

				Total for Question: 3 marks

M6.

	Working	Answer	Mark	Additional Guidance
(a)	$4(2x + 5) + 2(3x - 2)$ $8x + 20 + 6x - 4$	$14x + 16$	2	**M1** for either $8x + 20$ or $6x - 4$ or $4 \times 2x + 4 \times 5$ or $2 \times 3x - 2 \times 2$ or $14 \times$ or $+ 16$ **A1** for $14x + 16$
(b)	$x^2 + 5x + 8x + 40$	$x^2 + 13x + 40$	2	**B2** cao (**B1** for 3 or 4 of the 4 terms correct, can be implied by $x^2 + 13x + n$ or $nx^2 + 13x + 40$)
				Total for Question: 4 marks

M7.

	Working	Answer	Mark	Additional Guidance
(a)	$6x + 9 + 2x + 2 =$	$8x + 11$	2	**M1** for $3 \times 2x + 3 \times 3$ or $2 \times x + 2 \times 1$ or $6x + 9$ or $2x + 2$ or $8x$ or 11 **A1** for $8x + 11$ cao
(b)	$y^2 + 4y - 3y - 12$	$y^2 + y - 12$	2	**M1** for 3 out of 4 terms of $y \times y + 4 \times y - 3 \times y - 3 \times 4$ correct including signs, or 4 terms excluding signs **A1** for $y^2 + y - 12$ or $y^2 + 1y - 12$ cao

	Total for Question: 4 marks

M8.

	Working	Answer	Mark	Additional Guidance
(a)		$4p(2pq + 3)$	2	**B2** for $4p(2pq + 3)$ [B1 for $2p(2pq + 6)$ or $4(p^2q + 3p)$ or $p(4pq + 12)$ or $2(2p^2q + 6p)$]
(b)	$5 – 2(m – 3) = 5 – 2m + 6$	$11 – 2m$	2	**M1** for $5 – 2m + 6$ **A1** cao
				Total for Question: 4 marks

M9.

	Working	Answer	Mark	Additional Guidance
(a)		$2a + 4c$	1	**B1** $2a + 4c$ or $2(a + 2c)$
(b)	$½x \times ¼ \times (3)^2 =$ $½ \times ¼ \times 9 = 1.125$	1.125	2	**M1** for substitution: $½ \times ¼ \times 3^2$ oe **A1** 1.125, $1\frac{1}{8}$, $\frac{9}{8}$ oe
(c)		$x(x – 5)$	2	**B2** , accept $x(x + –5)$ (**B1** for x(linear expression in x) or $x – 5$ seen)
(d)	$x^2 + 3x + 4x + 12$	$x^2 + 7x + 12$	2	**B2** for fully correct (**B1** for 3 out of 4 terms correct in working

				including signs, **OR** 4 terms correct, with incorrect signs).
(e)		$(y + 3) \times (y + 5)$	2	**B2** for fully correct (**B1** for $(y + a)(y + b)$ with one of $ab = 15$, $a + b = 8$)
				Total for Question: 9 marks

M10.

	Answer	Mark	Additional Guidance
(a)	$3x^2 - 5xy$	2	**B2** for $3x^2 - 5xy$ (**B1** for $3x^2$ or $5xy$ seen)
(b)	$(x - 6)(x + 6)$	1	**B1** for $(x - 6)(x + 6)$ oe
			Total for Question: 3 marks

M11.

	Working	Answer	Mark	Additional Guidance
(a)		$20pq$	1	**B1** for $20pq$ oe
(b)		d^4	1	**B1** for d^4 cao
(c)	$4 \times 3a - 4 \times 7$	$12a - 28$	2	**M1** for $4 \times 3a$ or 4×7 or $12a$ or 28 **A1** for $12a - 28$ cao

(d)	$4n + 6 + 3n + 3$	$7n + 9$	2	**M1** for $4n + 6$ or $3n + 3$ **A1** for $7n + 9$
(e)		t^3	1	**B1** for t^3 (accept t^{1+2} oe)
(f)		m^2	1	**B1** for m^2 (accept m^{5-3} oe)
				Total for Question: 8 marks

M12.

	Answer	Mark	Additional Guidance
(a)	$13x + 17$	2	**M1** for $3 \times x + 3 \times 4$ **OR** $5 \times 2x + 5 \times 1$ **A1** cao
(b)	t^{10}	1	**B1** cao
(c)	p^3	1	**B1** cao
(d)	x^{12}	1	**B1** cao
			Total for Question: 5 marks

M13.

	Working	Answer	Mark	Additional Guidance
(a)		$4x - 12$	1	**B1** cao

(b)	$4t = 18$	4.5	2	**M1** for subtracting 1 from both sides seen or implied or division of all 3 terms by 4 **A1** 4.5 oe
				Total for Question: 3 marks

M14.

	Working	Answer	Mark	Additional Guidance
(a)		a^3	1	**B1** for a^3 cao
(b)	$5 \times 3x - 5 \times 2$	$15x - 10$	1	**B1** for $15x - 10$ cao
(c)	$3y \times y + 3y \times 4$	$3y^2 + 12y$	2	**M1** for $3y \times y + 3y \times 4$ or $3y^2 + a$ or $3y^2 + ay$ or $b + 12y$ or $by^2 + 12y$ where a, b are integers, and can be zero **A1** for $3y^2 + 12y$ or $3 \times y^2 + 12 \times y$ NB: If more than 2 terms in expansion M0A0
(d)	$2x - 8 + 3x + 6$	$5x - 2$	2	**M1** for $2 \times x - 2 \times 4$ or $2x - 8$ or $3 \times x + 3 \times 2$ or $3x + 6$ **A1** for $5x - 2$ cao
(e)	$x^2 + 4x - 3x - 12$	$x^2 + x - 12$	2	**M1** for 4 terms correct with or without signs, or 3 out of no more than 4 terms, with correct signs (the terms may be in an expression or table) or $x(x - 3) + 4(x - 3)$ or $x(x + 4) - 3(x + 4)$ **A1** for $x^2 + x - 12$ cao
				Total for Question: 8 marks

M15.

	Working	Answer	Mark	Additional Guidance
(a)	$5p = 20$	4	2	**M1** add 16 to both sides **A1** cao
(b)	$– 4 – 5 = 5q – 2q$	–3	2	**M1** for correct method isolate ± 3q **A1** cao
(c)	$6x – 3 − 10 – 6x =$	–13	2	**M1** at least one expansion correct **A1** cao
				Total for Question: 6 marks

E1. This algebra question was quite well answered. Almost 90% of candidates were awarded some credit for their answers to part (a). Common incorrect answers seen included 7e and 7e +6f. These could be awarded 1 mark for one correct term. The second part of the question was correctly answered by 84% of candidates whilst the success rate in the last part was 65%. In part (c) common incorrect answers included $3x^2y$, $4xy$ and $x(y + 2x)$.

E2. Algebra is not usually a strong point of candidates entered for foundation tier and they showed that in this paper there was no exception to this. In part (a) only 20% gained the mark and in part (b) where factorising was a requirement this reduced to 7%.

Many candidates tried to over simplify their algebraic expressions and therefore scored no marks.

E3. Part (a) was the most successful though a surprising number of candidates incorrectly oversimplified their correct answer. Part (b) and (c) were not well answered though some candidates gained partial credit in (b) for writing $\frac{x}{2xy}$ or $\frac{2}{4y}$.

E4. This question was answered correctly by about 50% of candidates. The other 50% of candidates gained at least one mark for multiplying out two brackets and getting 3 out of the 4 terms (x^2, $-3x$, $4x$, -12) correct. Very few candidates scored no marks.

E5. This question was poorly answered with few candidates able to factorise in part (a) but they had more success in part (b) with many candidates being able to gain at least one mark for multiplying out two brackets and getting 3 out of the 4 terms (x^2, $-3x$, $5x$, -15) correct but very few candidates were completely successful in giving the fully simplified answer.

E6. This was a standard expand and simplify question with a single bracket used in part (a) and two brackets in part (b). It was gratifying to see 42% of candidates obtaining all four marks for the question with a further 23% gaining 3 out of the four marks. The most common errors were for writing 20 – 4 as –16 or 24 in part (a) and only getting 3 out of the 4 terms correct when the two linear terms in x were multiplied.

E7. Only about one in three candidates scored full marks in this question.

In part (a) most candidates were able to expand at least one of the expressions "$3(2x + 3)$" and "$2(x + 1)$" successfully to gain 1 mark. However, it is disappointing to report that it was common to see candidates then attempting to multiply "$6x + 9$" and "$2x + 2$" or incorrectly combine them in some other way. Perhaps surprisingly, just as many candidates were successful in part (b) as in part (a). In this part of the question, in cases where a candidate could not be awarded both marks, examiners were often able to give one mark for either 3 out of 4 correct terms in their expansion or for 4 terms with some incorrect signs.

E9. This question gave students the opportunity to display their skills of algebraic manipulation and of algebraic substitution.
Usually candidates were successful on part (a), although there were many wrong answers, mainly from a misunderstanding of the relationship of the sign in a term with the term it acted on.

Part (b) had many cases of poor substitution, where, for example, $\frac{1}{4} \times 3^2$ was evaluated as $\left(\frac{1}{4} \times 3^2\right)$

Parts (c), (d) and (e) were all well done. The most common error in (c) was the difference of 2 squares misunderstanding as $(x - 5)(x + 5)$ or $(x - 2.5)(x + 25)$. The clumsy, but correct was awarded both marks.

On (d), the characteristic $x^2 + 7x + 7$ was occasionally seen and on (e) the 'factorisation' $y(y + 8) + 15$

E10. In part (a), many candidates were able to score at least 1 mark on this question. Common incorrect answers were and (each scoring 1 mark). A small number of candidates expanded the expression to, e.g. $3x \times x - 5x \times y$, then did not go on to simplify it. In part (b), about half the candidates were able to factorise the expression correctly. Common incorrect answers here were $(x - 6)^2$, $x(x - 36)$ and $(x - 6)$.

E11. This question was done well by the majority of the candidates. In part (a), most candidates were able to write down the answer $20pq$. Common incorrect answers here were $4p5q$, 9pq, $20p^2$ and $20q^2$. In part (b), the vast majority of candidates were able to write down the answer d^4. A very common incorrect answer here was $4d$. In part (c), about half the candidates were able to gain both marks. Common incorrect answers here were $12a - 7$, $7a - 28$ and $12a - 21$. In part (d), about three quarters of the candidates were able to score both marks and many that didn't were able to score a mark for either $4n + 6$ or $3n + 3$. Common incorrect answers here were $(4n + 6) + (3n + 1) = 7n + 7$ and $(4n + 3) + (3n + 3) = 7n + 6$ (each gaining 1 mark); and $(4n + 3) + (3n + 1) = 7n + 4$ (for 0 marks). A surprising number of candidates multiplied the expressions $(4n + 3) \times (3n + 3)$ instead of adding them. Parts (e) and (f) were generally done well. Common incorrect answers here were $(t \times t^2 =)\ t^2$ and $(m^5 \div m^3 =)\ m^{5/3}$ or m^{15}.

E12. Around 62% of candidates gained full marks in part (a). The most common error was to make a mistake in multiplying out one of the brackets. Over 85% of candidates answered part (b) correctly this dropped to 80% for part (c) and 56% for part (d).

E13. Part (a) was answered correctly by just over three quarters of candidates. The most common error was to multiply just the numerical term by 4 Part (b) was answered more successfully with approximately 85% of candidates solving the equation correctly.

E14. Parts (a) and (b) were generally well answered. The most common incorrect answer in (a) was 3a. In part (c) Most candidates managed to expand $3y \times y$ correctly and simplify to $3y^2$ but a few did not multiply $3y$ by 4 and just wrote 12 rather than $12y$. Hence $3y^2 + 12$ was the most common error seen. Expansion of both brackets in part (d) did not usually cause problems although a few multiplied the brackets together. Simplification caused more difficulties with the –8 term added leading to $5x + 14$ or a common arithmetic slip giving $2x + 3x = 6x$ Again, in part (e) the expansion of brackets was often successfully tackled but simplification led to more errors, caused usually by difficulties dealing with the negative terms. In the expansion, 4 and –3 were added rather than multiplied to give 1 leading to $x^2 + x + 1$ or just $x^2 + 1$. $-3x$ and $4x$ were sometimes combined to give $-x$ and a common mistake was to ignore the – sign and add these 2 terms to give $x^2 + 7x - 12$.