1(a). Express as a single fraction.

$$\frac{m+1}{n+1}-\frac{m}{n}$$

Simplify your answer.

(a) ______________________ [2]

(b). Using your answer to part **(a)**, prove that if *m* and *n* are positive integers and $m < n$, then

$$\frac{m+1}{n+1}-\frac{m}{n}>0.$$

[2]

2. Bethany says that $(2x)^2$ is always greater than or equal to $2x$.

Decide whether she is correct or not.

Show your working to justify your decision.

[3]

3(a). Prove that the sum of four consecutive whole numbers is always even.

[3]

(b). Give an example to show that the sum of four consecutive integers is **not** always divisible by 4.

[2]

4. Write as a single fraction in its simplest form.

$$\frac{5}{x-2}+\frac{4}{x+3}$$

____

[3]

5. Expand and simplify.

$$(4+\sqrt{3})(1+\sqrt{3})$$

____

[2]

6(a). Simplify fully.

$$\frac{16y^4}{2y^2}$$

______________________________ **[2]**

(b). Multiply out the brackets.

$4x^2\ (x - 6)$

______________________________ **[2]**

7(a). Simplify fully.

$$\frac{x^2 - 5x + 4}{x^2 - 2x - 8}$$

_______________________________ **[4]**

(b). Work out the value of *a* and the value of *b* in this identity.

$x^2 - 8x + b \equiv (x + a)^2 + 2$

a = _______________________________

b = _______________________________ **[3]**

8. You are given this identity

$5x + 3(2x - 7) \equiv ax + b$

where a and b are integers.

Find the values of a and b.

a = ______________________________

b = ______________________________ **[2]**

9(a). Factorise.

$x^2 - 9$

______________________________ **[1]**

(b). Factorise.

$x^2 - 4x + 3$

______________________________ **[2]**

(c). Use your answers to parts **(a)** and **(b)** to simplify this expression.

$$\frac{x^2 - 4x + 3}{x^2 - 9}$$

______________________________ **[1]**

10(a) Simplify fully.

.

$$\frac{15xy}{10y^2}$$

______________________________ **[2]**

(b). Factorise fully.

$4x^2 + 10xy$

______________________________ **[2]**

11(a) Factorise.

.

$x^2 + 2x - 15$

______________________________ **[2]**

(b). Hence solve this equation.

$x^2 + 2x - 15 = 0$

______________________________ **[1]**

(c). Simplify fully.

$$\frac{x^2 + 2x - 15}{x^2 - 9}$$

______________________________ **[2]**

12. Multiply out and simplify fully.

$(3 + \sqrt{7})(4 + \sqrt{7})$

You must show your working.

______________________________ **[2]**

13. Simplify fully.

$$\frac{14x^2}{2x}$$

______________________________ [2]

14(a) Simplify.

.

$$\left(\frac{a^5}{a^9}\right)^{-2}$$

______________________________ [2]

(b). Express as a single fraction in its simplest form.

$$\frac{4}{x-2} - \frac{5}{x+1}$$

______________________________ [3]

15. Write the expression $x^2 - 10x + 10$ in the form $(x - a)^2 - b$.

_____________________________ **[3]**

16(a) Write this expression as a single power of *x*.

.

$$\left(\frac{x^9}{x^{-3}}\right)^{\frac{1}{2}}$$

.... **[2]**

(b). Simplify.

$$\frac{x^2+2x-15}{x^2-9}$$

.... **[4]**

17.

(i) Write $x^2 - 6x + 4$ in the form $(x + a)^2 + b$.

(i) ______________________________ **[3]**

(ii) Using your answer to **(b)(i)**, or otherwise, solve $x^2 - 6x + 4 = 0$.
Write your answers correct to 1 decimal place.

(ii) x = ______________________ or x = ______________________ **[2]**

18(a) Write as a single power of x.

.

(i) $x^6 \times x^2$

(i)______________________________ [1]

(ii) $x^9 \div x^3$

(ii)______________________________ [1]

(b). Simplify.

$$\frac{9x^2 - 16}{3x^2 + 7x + 4}$$

______________________________ [4]

19. Express as a single fraction.

$$\frac{3}{2y} - \frac{4}{5y}$$

.... **[2]**

20. Factorise $15x^2 + x - 2$.

.... **[2]**

21. Write $x^2 - 10x + 16$ in the form $(x + a)^2 + b$.

.... **[3]**

22.

Simplify.

$$\frac{x^2 - 16}{x^2 - 3x - 4}$$

.... **[4]**

23.

Write as a single fraction in its simplest form.

$$\frac{3}{x-1}+\frac{4}{x+2}$$

____________________ [3]

24.

Simplify.

(i) $a^6 \div a^2$

(i) __________________ [1]

(ii) $(b^5)^3$

(ii) __________________ [1]

25.

Expand and simplify.

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

.... [4]

26(a)
. Write $x^2 - 6x + 20$ in the form $(x - a)^2 + b$.

.... [3]

(b). Write down the turning point of the graph of $y = x^2 - 6x + 20$.

(.................... , ...) [2]

END OF QUESTION PAPER

Question			Answer/Indicative content	Marks	Part marks and guidance	
1	a		$\dfrac{n-m}{n(n+1)}$	2	**M1** for $\dfrac{n(m+1)-m(n+1)}{n(n+1)}$	
	b		$m < n \Rightarrow n - m > 0$ $\Rightarrow \dfrac{n-m}{n(n+1)} > 0$ $\Rightarrow \dfrac{m+1}{n+1} - \dfrac{m}{n} > 0$	2	**M1** for *their* ' $\dfrac{n-m}{n(n+1)}$ ' > 0	
			Total	4		
2			e.g. When $x = 0.1$ $(2x)^2 = 0.04$ $2x = 0.2$ So $(2x)^2 < 2x$ which contradicts Bethany's statement So it is not always true	3	**M1** for attempting to demonstrate that for some value of x in range $0 < x < \frac{1}{2}$ it is not true **A1** for complete working **A1** for explanation or **M1** for attempt including squaring bracket **A1** for complete solution for either $x < 0$ or $x \geq \frac{1}{2}$ **A1** for explanation or **B1** for a counter example given without working	
			Total	3		
3	a		x, $x + 1$, $x + 2$, $x + 3$ $x + (x + 1) + (x + 2) + (x + 3)$ or $4x + 6$ $2(x + 3)$	1 1 1	accept correct alternatives	
	b		e.g. 1 + 2 + 3 + 4 $4x + 6$ is not a multiple of 4	1 1	 Allow e.g. 1 + 2 + 3 + 4 = 10 is not a multiple of 4	
			Total	5		

Question			Answer/Indicative content	Marks	Part marks and guidance	
4			$\frac{9x+7}{(x-2)(x+3)}$ or $\frac{9x+7}{x^2+x-6}$ final answer	3	**M1** for $5(x + 3) + 4(x - 2)$ or $5x + 15 + 4x - 8$ or better seen **M1** for correct common denominator seen as a denominator	Mark final answer but **isw** for incorrect expansion of denominator after correct answer seen Condone missing brackets in denominator for **M1** if intention clear, but for **3 marks** all brackets must be present or correct expansion found Method marks may be awarded when expression is written as two fractions <u>Examiner's Comments</u> Many candidates understood what was required and attempted to use a common denominator and add the fractions. The final denominator was often correct even if candidates had expanded the brackets in the denominator. It should be noted that expansion of the brackets in the denominator is not required in a fraction in its simplest form, but for full credit the expansion must be correct if this form is used. Candidates often showed the correct expression of $5(x + 3) + 4(x - 2)$ for the numerator, however errors in the expansion were often seen, with 15 – 8 often evaluated as –7 instead of + 7. Very few candidates went on to spoil a correct answer by incorrect cancelling. Some weaker candidates simply added the terms on the numerator and the terms on the denominator leading to an answer of $\frac{9}{2x+1}$.

Question			Answer/Indicative content	Marks	Part marks and guidance	
			Total	3		
5			$7 + 5\sqrt{3}$ final answer	1	**M1** for multiplication of terms in brackets leading to $4+\sqrt{3}+4\sqrt{3}+3$ with at least two terms correct in an expression with three or four terms	For **M1** $(\sqrt{3})^2$ or $\sqrt{3}\sqrt{3}$ or $\sqrt{9}$ is acceptable in place of the 3 For **M1** $5\sqrt{3}$ may be counted as two of the required three or four terms eg $5 + 5\sqrt{3}$ would score M1 Examiner's Comments Many candidates used the correct method to expand the brackets and gained at least 1 mark. Some errors were seen in one or more of the terms in the four term expansion, for example 4 × 1 = 5, √3 × √3 = 9, 4 × √3 = √12, but generally at least two of the terms were correct. Simplifying the surds to reach the correct answer of 7 + 5√3 was more problematic and many candidates did not know that √3 + 4√3 = 5√3.
			Total	2		

Question			Answer/Indicative content	Marks	Part marks and guidance	
6	a		$8y^2$ final answer	2	**B1** for $\frac{8y^4}{y^2}$ or $\frac{16y^2}{2}$ or $\frac{8y^2}{1}$	<u>Examiner's Comments</u> This was not well done. $\frac{8y^2}{y}$ was a common wrong answer where candidates cancelled the terms incorrectly. It was clear that cancelling was not well understood.
	b		$4x^3 - 24x^2$ final answer	2	**B1** for $4x^3$ or $- 24x^2$ seen	<u>Examiner's Comments</u> This was tackled well with many fully correct answers.
			Total	4		

Question			Answer/Indicative content	Marks	Part marks and guidance	
7	a		$\frac{x-1}{x+2}$	4	**M3** for (x – 4)(x – 1) and (x – 4)(x + 2) **Or M2** for (x – 4)(x – 1) or (x – 4)(x + 2) **Or M1** for (x ± 4)(x ± 1) or (x ± 4)(x ± 2)	<u>Examiner's Comments</u> A good number of candidates factorised correctly and cancelled the common factor appropriately. There was the odd sign error in some work. Many just cancelled the x^2 terms and thought they had done enough whereas others went further, trying to cancel the x terms and the the number terms separately.
	b		a = – 4 b = 18	3	**B2** for a = –4 **Or M1** for $x^2 + ax + ax + a^2$ or $(x - 4)^2$ After zero scored **SC1** for *their b* = *(their a)*^{2} + 2	<u>Examiner's Comments</u> There were few correct answers. Multiplying out the brackets and comparing coefficients seemed to be the common approach though some tried to complete the square on the left. Less able candidates used a trial and improvement approach with no success.
			Total	7		

Question			Answer/Indicative content	Marks	Part marks and guidance	
8			$a = 11$	1	**0** for 11 if it comes from eg $11x^2$	
			$b = –21$	1	Allow **1** for –21 independent of errors in coping with the x's If **0** for question, allow **SC1** for LHS = $11x – 21$ soi <u>Examiner's Comments</u> Candidates often managed to simplify the left hand side to $11x – 21$, but seeing the connection with a and b was rarer. Sometimes b was given as 21 instead of –21. Some candidates used the wrong order of operations and attempted to work out the left hand side as $(5x + 3)(2x – 7)$.	
			Total	2		

Question			Answer/Indicative content	Marks	Part marks and guidance	
9	a		$(x - 3)(x + 3)$ final answer	1	**Examiner's Comments** Only better candidates knew how to factorise the quadratic expressions.	
	b		$(x - 3)(x - 1)$ final answer	2	**M1** for $(x \pm 3)(x \pm 1)$ **Examiner's Comments** Only better candidates knew how to factorise the quadratic expressions.	
	c		$\frac{x-1}{x+3}$ final answer	1	**Examiner's Comments** Some wrote their fraction upside down. Many candidates used very spurious algebra to simplify their fraction.	
			Total	4		

Question			Answer/Indicative content	Marks	Part marks and guidance	
10	a		$\frac{3x}{2y}$ final answer	2	**B1** for $\frac{3xy}{2y^2}$ or $\frac{15x}{10y}$ or $\frac{1.5x}{y}$ seen **Examiner's Comments** Some candidates only partially cancelled the fraction or left their answer in an inappropriate form eg. $1.5xy^{-1}$.	
	b		$2x(2x + 5y)$ final answer	2	**B1** for $2(2x^2 + 5xy)$ or $x(4x + 10y)$ seen **Or SC1** for $4x(x + 2.5y)$ or (2x + 0)(2x + 5y) seen **Examiner's Comments** This was usually correct though a few candidates only took one common factor. There were those who saw the word 'factorise' and the x^2 in the expression and so tried to create two sets of brackets. These were usually unsuccessful.	
			Total	4		

Question			Answer/Indicative content	Marks	Part marks and guidance	
11	a		$(x + 5)(x - 3)$ final answer	2	**B1** for $(x \pm 5)(x \pm 3)$ seen	
	b		–5, (+)3	FT1	FT from *their* 2 brackets only	
	c		$\frac{x+5}{x+3}$ final answer	2	**B1** for $(x + 3)(x - 3)$ seen **Examiner's Comments** Part (a) was very often correct. Occasionally, the signs in the brackets were wrong or it was treated as an equation and solutions were found. Less aware candidates only factorised the letter parts of the expression and wrote $x(x + 2) - 15$. Whilst many gave the two correct values, a number only gave the positive solution. Some candidates failed to realise the significance of the word 'hence' and started again, using trial and improvement or the quadratic formula. Better candidates knew to factorise $x^2 - 9$ first, though a significant number 'cancelled' the x^2 terms either leaving $\frac{2x-15}{-9}$ as their answer or going further with spurious cancelling.	
			Total	5		

Question			Answer/Indicative content	Marks	Part marks and guidance	
12			Three of 3 × 4; 3 × √7; 4 × √7; √7 × √7 oe 19 + 7√7 final answer	M1 B1	**Examiner's Comments** This question was answered well. Most obtained the correct answer and those who decided to give their answer as a decimal usually did so after correctly multiplying out the brackets. Surprisingly, some left their answer as 12 + 7√7 + 7and others had difficulty in finding 3√7 + 4√7.	
			Total	2		
13			7*x* final answer	2	**B1** for $\frac{7x}{1}$ or for $\frac{14x}{2}$ or $\frac{7x^2}{x}$ seen **Examiner's Comments** This was answered quite well with candidates dealing appropriately with both the number and the *x* terms. Some only partially simplified the expression.	
			Total	2		

Question			Answer/Indicative content	Marks	Part marks and guidance	
14	a		a^8	2	**M1** for $(a^{-4})^{-2}$ or $\left(\frac{1}{a^4}\right)^{-2}$ or $\left(\frac{a^9}{a^5}\right)^2$ or or $\frac{a^{-10}}{a^{-18}}$ or $\frac{a^{18}}{a^{10}}$ seen **Examiner's Comments** Candidates who understood the laws of indices could reach a correct answer in part (b), usually showing a correct intermediate step of either $(a^{-4})^{-2}$ or $\frac{a^{-10}}{a^{-18}}$. Candidates again failed to gain full credit because of inability to deal with negative numbers, with ⁻2 × ⁻4 seen evaluated as ⁻8 or ⁻6 and ⁻10 – ⁻18 seen evaluated incorrectly. Common misconceptions were that 2 should be subtracted from each of the powers or that a power of ⁻2 was equivalent to the square root.	condone a^{-4-2} for M1

Question			Answer/Indicative content	Marks	Part marks and guidance	
	b		$\frac{14-x}{(x-2)(x+1)}$ or $\frac{14-x}{x^2-x-2}$	3	**M1** for $4(x + 1) – 5(x – 2)$ or $4x + 4 – 5x + 10$ with three terms correct or better seen **M1** for correct common denominator seen as denominator **Examiner's Comments** Many candidates had no idea how to approach part (c) and tried to incorrectly subtract or cancel the numerators and denominators. However, a reasonable proportion of the candidates identified the correct process of using a common denominator and showed some partially correct working. Problems with negatives caused many errors in this part as well, with simplification of $4(x + 1) – 5(x – 2)$ to $4x + 4 – 5x – 10$ being very common. Some candidates who had reached answers of the correct form then went on to incorrectly 'cancel' terms, for example going from $\frac{-x-6}{x^2-x-2}$ to $\frac{-6}{x^2-2}$.	Mark final answer but **isw** for incorrect expansion of denominator after correct denominator seen May be in two separate fractions condone missing final bracket in denominator
			Total	5		

Question			Answer/Indicative content	Marks	Part marks and guidance	
15			$(x – 5)^2$ – 15 final answer	3	**B2** for – 15 or FT their $(x \pm a)^2$ or **B1** for $(x – 5)^2$ If **0** scored award **SC2** for $(x – 5)^2$ – 15 in working <u>Examiner's Comments</u> Most candidates could not answer this correctly. In many successful attempts candidates wrote $(x – 5)^2$ clearly and then expanded it to $x^{2 -}$ 10x + 25, which then made it possible to find the value of *b*.	mark final answer and condoneor double signs eg + – 15
			Total	3		

Question			Answer/Indicative content	Marks	Part marks and guidance	
16	a		x^6	2	**M1** for x^{12} or $(x^n)^{½} = x^{0.5n}$ eg$(x^6)^{½} = x^3$ Examiner's Comments Many candidates were unsure of the rules for indices. Working was often haphazard and difficult to follow. A common error was x9 ÷ x–3 = x9 – 3 = x6 leading to a final answer of x3. Several incorrect methods led to a seemingly correct answer e.g. x3 ÷ x–3 = x6 or x18 ÷ x–6 = x12 then (x12)0.5 =x6.	
	b		$\frac{x+5}{x+3}$final answer	4	**B2** for $(x + 5)(x – 3)$ or **B1** for $(x + a)(x + b)$ where $a + b = 2$ or $ab = {}^{-}15$ and **B1** for $(x + 3)(x – 3)$ Examiner's Comments Many candidates did not recognise the quadratics and attempted to cancel terms. It was common to see x^2 being cancelled in the numerator and denominator with $2x^{-}\ 6$ being a common answer. Those who did factorise usually reached the correct final answer. A few gave an unsimplified answer while others spoilt a correct answer by further wrong cancelling of x to give $\frac{5}{3}$.	
			Total	6		

Question			Answer/Indicative content	Marks	Part marks and guidance	
17		i	$(x-3)^2-5$ as final answer	3	**B1** for $(x-3)^2$ **B2FT** for – 5 or a correct **FT** from *their* '$(x-3)^2$'	condone + –5 and + –3 **FT**$(x-p)^2$ only If this is blank (NR) then you can award **SC2** if $(x-3)^2-5$ [= 0] is seen in **(b)(ii)**
		ii	0.8, 5.2	2	**B1, B1** correct or **FT** *their* **(i)** accept $3+\sqrt{5}$, $3-\sqrt{5}$ for 2 marks if 0 scored **SC1** for 5.236... and 0.763... **rot** to at least 2 dp __Examiner's Comments__ This posed problems and although some were able to halve the ⁻6 and obtain $(x-3)^2$, they could not find a way to work out ⁻5. A common answer was 13 or ⁻13 from 9 + 4. Some wrote $(x+3)^2$ although the question was set out in the usual way. Many of them did go on to work out the $^{-5}$ correctly. In (b)(ii) few used the answer to (i) and so it was common to see the quadratic formula used, in some cases very successfully.	
			Total	5		

Question			Answer/Indicative content	Marks	Part marks and guidance	
18	a	i	x^8	1	Mark final anaswer	
		ii	x^6	1	Mark final answer **Examiner's Comments** The majority of candidates correctly applied the laws of indices in parts (i) and (ii). Only a small minority made the expected errors of multiplying or dividing the powers, but some candidates thought they were being asked for the powers and gave the answers as 8 and 6.	

Question			Answer/Indicative content	Marks	Part marks and guidance	
	b		$\frac{3x - 4}{x + 1}$	4	Mark final answer **M1** for $(3x + 4)(3x – 4)$ **seen** AND **M2** for $(3x + 4)(x + 1)$ **seen** Or **M1** for factors using integers excluding 0 giving two terms correct when expanded or $(3x \pm 4)(x \pm 1)$ AND **M1** for correct simplification of *their* algebraic fraction **Max 3 marks if answer is incorrect** **Examiner's Comments** Most candidates did not understand what was required in this part and many omitted the question completely with others trying to cancel individual terms or to treat it as an equation to solve. Of those candidates who understood that factorisation was required, most successfully factorised the numerator as the difference of two squares and many went on to reach the correct final answer although a number had difficulty factorising the denominator. Some candidates gained one of the two available marks for factorising the denominator by finding ‘factors’ that would expand to give two terms correct, many from use of a trial and error approach. Following an incorrect factorisation of the denominator some candidates reached an expression that could be cancelled down and gained a further method mark for this.	e.g. M1 for $(3x + 1)(x + 4)$

Question			Answer/Indicative content	Marks	Part marks and guidance	
			Total	6		
19			$\frac{7}{10y}$ oe final answer	2	**M1** for $\frac{3\times5}{5\times2y}$ and $\frac{4\times2}{2\times5y}$ oe soi OR **SC1** for final answer $\frac{7}{10}$ oe **Examiner's Comments** Many candidates correctly subtracted the algebraic fractions and reached the correct answer. As the question did not require an answer in its simplest form the common answers of $\frac{7}{10y}$ and $\frac{7y}{10y^2}$ were both accepted. Some candidates attempted to use a common denominator but failed to deal with the *y* terms correctly and reached an answer of $\frac{7y}{10y}$ or $\frac{7}{10}$ which were both given 1 mark. Some candidates simply subtracted the numerators and subtracted the denominators and did not score.	Accept integer / integer values only for 2 marks eg $\frac{7y}{10y^2}$ but not eg $\frac{3.5}{5y}$ which would get **M1**
			Total	2		

Question			Answer/Indicative content	Marks	Part marks and guidance	
20			$(3x - 1)(5x + 2)$	2	**M1** for $(3x \pm 1)(5x \pm 2)$ seen or pair of factors giving two correct terms when expanded, seen or implied in table **Examiner's Comments** Many candidates clearly understood what was required in factorising an expression. Many candidates realised that $15x^2$ was the product of $5x$ and $3x$ or $15x$ and x and went on to give an expression that expanded to give $15x^2$ and $^-2$. Very few candidates went on to check that the expansion of their brackets would also give $+ x$ as the third term. Some candidates simplified the problem by factorising $x^2 + x - 2$, then multiplying their result by 15 and others tried to take out a common factor, often of only the first two terms.	Condone omission of final bracket only Accept $(1 - 3x)(-5x - 2)$ for 2 marks Accept eg $(15x - 1)(x + 2)$ for **M1**
			Total	2		

Question			Answer/Indicative content	Marks	Part marks and guidance	
21			$(x - 5)^2$ final answer –9 final answer	1 2	FT *their* $(x - 5)^2$ final answer **Examiner's Comments** This topic was regularly not answered well on the previous qualification and this continues here. In the bracket there were some who wrote $x + 5$ instead of $x - 5$ and there were many who thought the value of b to be + 16.	
			Total	3		

Question			Answer/Indicative content	Marks	Part marks and guidance	
22			$\frac{x+4}{x+1}$ final answer nfww	4	**M1** for $(x + 4)(x - 4)$ AND **M2** for $(x - 4)(x + 1)$ Or **M1** for $x(x + 1) - 4(x + 1)$ seen or $x(x - 4) + 1(x - 4)$ seen or for $(x + a)(x + b)$ where $a + b = -3$ or $ab = -4$ **Examiner's Comments** In part (a) those who knew to factorise the numerator and denominator usually gained full marks. Some candidates equated $x^2 - 16$ with $(x - 4)^2$, whilst the weaker candidates cancelled the x^2 terms and 16 by 4 to reach the incorrect answer of $\frac{-4}{-3x}$.	nfww please check working not just answer
			Total	4		

Question			Answer/Indicative content	Marks	Part marks and guidance	
23			$\frac{7x+2}{(x-1)(x+2)}$ or $\frac{7x+2}{x^2+x-2}$ as final answer	3 3 AO1.3b	**B1** for $(x-1)(x+2)$ or x^2+x-2 seen as a denominator **M1** for $3(x+2)+4(x-1)$ or $3x+6+4x-4$ soi **Examiner's Comment** Only a minority of candidates simplified the indices correctly in part (a). There was a wide variety of wrong answers, the most common coming from adding the powers to get $3y^{-1}$, but others included $2y^7$, $2y^1$, $3y^7$ and $3y$. Many candidates scored full marks in part (b) however and many others made a very good attempt, often scoring 2 method marks. The multiplying out of the $4(x-1)$ bracket to $4x-1$ led to many lost marks. Quite a few candidates reached the correct answer and then went on to try and simplify the fraction, even though there was no common factor between the numerator and denominator. Some candidates expanded the numerator correctly, but then collected the terms as $7x-2$. There were some answers of $\frac{7}{2x+1}$ and $\frac{7}{(x-1)(x+2)}$.	Condone missing final bracket. Accept not in fraction or seen in separate fractions
			Total	3		

Question			Answer/Indicative content	Marks	Part marks and guidance	
24		i	a^4	1	**Examiner's Comments** Part (a) was answered well, the incorrect answers seen were (i) a^3 and (ii) b^8 due to incorrect laws being applied.	
		ii	b^{15}	1	**Examiner's Comments** Part (a) was answered well, the incorrect answers seen were (i) a^3 and (ii) b^8 due to incorrect laws being applied.	
			Total	2		

Question			Answer/Indicative content	Marks	Part marks and guidance	
25			$6x^3 + 23x^2 - 33x + 10$	4	**M3** for a fully correct method with at most one error e.g.$(2x^2 + 9x - 5)(3x - 2) = 6x^3 + 27x^2 - 15x - 4x2 - 18x + 10$ or better or **M2** for a correct method to multiply two brackets e.g. $2x^2 + 10x - x - 5$ or $3x^2 + 15x - 2x - 10$ or better or **M1** for a correct method with at most two errors or a correct method to multiply two brackets with at most one erro Examiner's Comments In part (b) it was clear that many candidates did not know how to expand three brackets and multiplying each term by every other term was very common. Those that used a table to expand the brackets did	

Question			Answer/Indicative content	Marks	Part marks and guidance	
					tend to have more success.	
			Total	4		
26	a		$(x - 3)2 + 11$ final answer	3	**B1** for $(x - 3)^2$ **B2** for +11 or **FT** *their* $(x - 3)^2$ Examiner's Comments Part (a) was a straightforward question and yet many candidates failed to progress. Some did get the square term correct, $(x - 3)^2$ and then they usually put +20 for the *'b'* term. Few knew how to calculate the constant term and no-one checked their answer by expanding.	
	b		(3, 11)	2	**B1FT** for each part | **FT** *their* $(x - a)^2 + b$ e.g. (a, b) Examiner's Comments Part (b) was testing understanding the use of this technique to find the turning point and very few knew how to do this.	
			Total	5		