This is a non−calculator test (50 minutes).

The following marks are awarded for each question.

B	Unconditional accuracy mark
M	Method mark – the correct method must be shown but there may be an arithmetic error; the sight of the value given in brackets implies the award of the method mark
A	Accuracy mark – unless the question specifies that working **must** be shown then the sight of the correct answer implies the award of full marks (unless the answer clearly comes from incorrect working)
C	Communication mark
P	Process mark to show correct process for problem solving. Any other process of a similar standard to achieve an accurate result is acceptable to achieve this mark
FT	Incorrect values may be **followed through** from one step to the next **provided** that the correct method is seen in each step and the only errors are arithmetic. This is shown in mark schemes by putting a number in inverted commas
OE	Or equivalent answer mark

Q	Answer	Mark	Comment
1	$10x + 15 + 4x - 8$	M1	for attempt at expanding brackets, e.g. $10x + 15 + 4x - 8$; must have at least three terms correct
	$14x + 7$	M1	simplify expanded brackets
	14 and 7 are both multiples of 7, so $5(2x + 3) + 4(x - 2)$ is a multiple of 7	C1	sight of 14 and 7 or $7(2x + 1)$ and comment that they are both multiples of 7
3	-6	B1	

5	$(3x - 1)(x + 2)$ and $4x$ OE	P1	process of forming an expression for the area of each rectangle
	$3x^2 + 6x - x - 2 - 4x$ OE	P1	form an expression for the shaded area with the brackets expanded
	$3x^2 + x - 2 = 60$ so $3x^2 + x - 62 = 0$	C1	a correct method leading to $3x^2 + x - 62 = 0$
7	$\frac{3}{x+2}$	M1	for factorising the denominator $(x \pm 2)(x \pm 5)$
		A1	$\frac{3}{x+2}$

9	$x=\sqrt[3]{9a^2-2}$	M1	square both sides and multiply by 9, e.g. $9a^2=x^3+2$
		A1	
11	$9n^2 + 30n + 25 - (9n^2 - 30n + 25)$	C1	at least three terms correct in expansion of either $(3n + 5)^2$ or $(3n - 5)^2$ or $((3n + 5) - (3n - 5))((3n + 5) + (3n - 5))$
	$60n$	C1	
	$60n$ is a multiple of 12 or $60n = 12 \times 5n$ or $60n \div 12 = 5n$	C1	
13a	14	B1	
13b	$3x - 1$	M1	For $x=\frac{y+1}{3}$ **and** $3x = y + 1$
		A1	$3x - 1$
13c	Proof	C1	For a method to find the composite function, e.g. $2(2(x - 1) - 1)$
		C1	for correct working leading to $4x - 6$, e.g. $= 2(2x - 3) = 4x - 6$

15	$-4+4\sqrt{2}$	M1	$\frac{4}{\left(1+\sqrt{2}\right)}\times\frac{\left(1-\sqrt{2}\right)}{\left(1-\sqrt{2}\right)}$
		A1	$-4+4\sqrt{2}$ OE with a rational denominator
17	$\frac{x(y+1)-x}{(y+1)^2}$ or $\frac{x(y+1)^2-x(y+1)}{(y+1)^3}$	C1	OE
	e.g. $\frac{xy+x-x}{(y+1)^2}=\frac{xy}{(y+1)^2}$	C1	for correct working leading to $\frac{xy}{(y+1)^2}$

Question	Topic	Step	Marks
1	Argue mathematically to show algebraic expressions are equivalent	9th	3
2	Argue mathematically to show algebraic expressions are equivalent	9th	3
3	Given f(x)where f(x) is a linear function, find a when f(a)= whole number	9th	1
4	Add, subtract and simplify algebraic fractions where the denominator is a whole number	9th	3
5	Use algebra to support simple proofs	10th	3
6	Change the subject of a formula which involves rearranging and squaring or square root	9th	2
7	Simplify algebraic fractions involving factorising quadratic expressions of the form $x^2 \pm bx \pm c$ either in the numerator or denominator.	10th	2
8	Change the subject of a formula including where the subject is the denominator of a fraction	9th	4
9	Change the subject of a complex formula that involves cubing or cube root	11th	2
10	Add, subtract and simplify algebraic fractions where the denominators are both algebraic expressions	10th	3
11	Use algebra to support simple proofs	10th	3
12	Simplify algebraic fractions involving factorising quadratic expressions of the form $ax^2 \pm bx \pm c$ where $a \neq 1$ either in the numerator or denominator	11th	3
13a	Given f(x), find f(a) where a is a integer or fraction	8th	1
13b	Find the inverse of a linear function	12th	2
13c	Interpret the succession of two functions as a 'composite function'	12th	2
14	Write $(3-\sqrt{3})^2$ in the form $a+b\sqrt{3}$	12th	2
15	Rationalise a denominator when the denominator is an expression involving surds, e.g. $\frac{(6+\sqrt{2})}{(8-\sqrt{2})}$	12th	2
16	Solve quadratic equations arising from algebraic fractions	12th	3
17	Add, subtract and simplify algebraic fractions where the denominators are both algebraic expressions	10th	2