1.

Question	Answer	Marks
8(i)	State or imply the form $\frac{A}{2x+1}+\frac{Bx+C}{x^2+9}$	**B1**
	Use a correct method for finding a constant	**M1**
	Obtain one of $A=3$, $B=1$ and $C=0$	**A1**
	Obtain a second value	**A1**
	Obtain the third value	**A1**
		5

2.

Question	Answer	Marks
9(i)	State or imply the form $A+\frac{B}{x-1}+\frac{C}{3x+2}$	**B1**
	State or obtain $A=4$	**B1**
	Use a correct method to obtain a constant	**M1**
	Obtain one of $B=3$, $C=-1$	**A1**
	Obtain the other value	**A1**
		5

3.

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Question	Answer	Marks	
9(i)	Use a correct method to find a constant	**M1**	
	Obtain one of the values $A=-3$, $B=1$, $C=2$	**A1**	
	Obtain a second value	**A1**	
	Obtain the third value	**A1**	
		4	

4.

Question	Answer	Marks
6(i)	Carry out relevant method to find A and B such that $\frac{1}{4-y^2} \equiv \frac{A}{2+y} + \frac{B}{2-y}$	**M1**
	Obtain $A = B = \frac{1}{4}$	**A1**
	Total:	**2**

5.

Question	Answer	Marks	
9(i)	State or imply the form $\frac{A}{2-x} + \frac{B}{3+2x} + \frac{C}{(3+2x)^2}$	**B1**	
	Use a correct method to find a constant	**M1**	
	Obtain one of $A = 1$, $B = -1$, $C = 3$	**A1**	
	Obtain a second value	**A1**	
	Obtain the third value [Mark the form $\frac{A}{2-x} + \frac{Dx+E}{(3+2x)^2}$, where $A = 1$, $D = -2$ and $E = 0$, B1M1A1A1A1 as above.]	**A1**	
		5	

6.

Question	Answer	Marks	Guidance
8(i)	State or imply the form $\frac{A}{1-2x} + \frac{B}{2-x} + \frac{C}{(2-x)^2}$	**B1**	
	Use a correct method for finding a constant M1 is available following a single slip in working from their form but no A marks (even if a constant is "correct")	**M1**	$7 = A + 2B$ $-15 = -4A - 5B - 2C$ $8 = 4A + 2B + C$
	Obtain one of $A = 1$, $B = 3$, $C = -2$	**A1**	
	Obtain a second value	**A1**	
	Obtain the third value	**A1**	
	[Mark the form $\frac{A}{1-2x} + \frac{Dx+E}{(2-x)^2}$, where $A = 1$, $D = -3$ and $E = 4$, B1M1A1A1A1 as above.]		
		5	

7.

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Question	Answer	Marks
9(i)	State or imply the form $\frac{A}{2-x}+\frac{B}{3+2x}+\frac{C}{(3+2x)^2}$	**B1**
	Use a correct method to find a constant	**M1**
	Obtain one of $A=1$, $B=-1$, $C=3$	**A1**
	Obtain a second value	**A1**
	Obtain the third value [Mark the form $\frac{A}{2-x}+\frac{Dx+E}{(3+2x)^2}$, where $A=1$, $D=-2$ and $E=0$, B1M1A1A1A1 as above.]	**A1**
		5

8.

PUBLISHED

Question	Answer	Marks
8(i)	State or imply the form $A+\frac{B}{2+x}+\frac{C}{3-2x}$	**B1**
	Use a correct method for finding a constant	**M1**
	Obtain one of $A=2$, $B=-4$ and $C=6$	**A1**
	Obtain a second value	**A1**
	Obtain the third value	**A1**
		5

9.

PUBLISHED

Question	Answer	Marks	Guidance
8(i)	State or imply the form $\frac{A}{2+x}+\frac{B}{3-x}+\frac{C}{(3-x)^2}$	**B1**	
	Use a correct method to obtain a constant	**M1**	
	Obtain one of $A=2$, $B=2$, $C=-7$	**A1**	
	Obtain a second value	**A1**	
	Obtain the third value	**A1**	[Mark the form $\frac{A}{2+x}+\frac{Dx+E}{(3-x)^2}$, where $A=2$, $D=-2$ and $E=-1$, B1M1A1A1A1.]

10.

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Question	Answer	Marks	Guidance
8(i)	State or imply the form $\frac{A}{2x+1}+\frac{B}{2x+3}+\frac{C}{(2x+3)^2}$	**B1**	
	Use a correct method to find a constant	**M1**	
	Obtain the values $A=1$, $B=-1$, $C=3$	**A1 A1 A1**	
	[Mark the form $\frac{A}{2x+1}+\frac{Dx+E}{(2x+3)^2}$, where $A=1$, $D=-2$ and $E=0$, B1M1A1A1A1 as above.]		Full marks for the three correct constants – do not actually need to see the partial fractions
		5	

11.

Question	Answer	Marks	Guidance
9(i)	State or imply the form $\frac{A}{3+x}+\frac{B}{1-x}+\frac{C}{(1-x)^2}$	**B1**	
	Use a correct method for finding a constant	**M1**	
	Obtain one of $A=-3$, $B=-1$, $C=2$	**A1**	
	Obtain a second value	**A1**	
	Obtain the third value	**A1**	Mark the form $\frac{A}{3+x}+\frac{Dx+E}{(1-x)^2}$, where $A=-3$, $D=1$ and $E=1$, B1M1A1A1A1 as above.
		5	

12.

Question	Answer	Marks	Guidance
8(i)	State or imply the form $\frac{A}{x}+\frac{B}{x^2}+\frac{C}{x+2}$	**B1**	
	Use a correct method for finding a constant	**M1**	
	Obtain one of $A=-1$, $B=3$, $C=2$	**A1**	
	Obtain a second value	**A1**	
	Obtain the third value	**A1**	Allow in the form $\frac{Ax+B}{x^2}+\frac{C}{x+2}$
		5	

13.

Question	Answer	Marks
8(i)	State or imply the form $\frac{A}{2x-1}+\frac{Bx+C}{x^2+2}$	**B1**
	Use a correct method for finding a constant	**M1**
	Obtain one of $A=4$, $B=-1$, $C=0$	**A1**
	Obtain a second value	**A1**
	Obtain the third value	**A1**
		5

14.

Question	Answer	Marks
9(a)	State or imply the form $\frac{A}{1+2x}+\frac{B}{1-2x}+\frac{C}{2+x}$	**B1**
	Use a correct method for finding a constant	**M1**
	Obtain one of $A=-2$, $B=1$ and $C=4$	**A1**
	Obtain a second value	**A1**
	Obtain the third value	**A1**
		5

15.

Question	Answer	Marks
7(a)	State or imply the form $\frac{A}{2x-1}+\frac{B}{2x+1}$ and use a relevant method to find A or B	**M1**
	Obtain $A=1$, $B=-1$	**A1**
		2
7(b)	Square the result of part **(a)** and substitute the fractions of part **(a)**	**M1**
	Obtain the given answer correctly	**A1**
		2

16.

Question	Answer	Marks	Guidance
9(a)	State or imply the form $\frac{A}{1-x}+\frac{B}{2+3x}+\frac{C}{(2+3x)^2}$	**B1**	
	Use a correct method for finding a coefficient	**M1**	
	Obtain one of $A = 1$, $B = -1$, $C = 6$	**A1**	
	Obtain a second value	**A1**	
	Obtain the third value	**A1**	In the form $\frac{A}{1-x}+\frac{Dx+E}{(2+3x)^2}$, where $A = 1$, $D = -3$ and $E = 4$ can score B1 M1 A1 A1 A1 as above.
		5	

17.

Question	Answer	Marks	
9(a)	State or imply the form $\frac{A}{3x+2}+\frac{Bx+C}{x^2+4}$	**B1**	
	Use a correct method for finding a constant	**M1**	
	Obtain one of $A = 3$, $B = -1$, $C = 3$	**A1**	
	Obtain a second value	**A1**	
	Obtain the third value	**A1**	
		5	

18.

Question	Answer	Marks	Guidance
9(a)	State or imply the form $\frac{A}{1-x}+\frac{B}{2+3x}+\frac{C}{(2+3x)^2}$	**B1**	
	Use a correct method for finding a coefficient	**M1**	
	Obtain one of $A = 1$, $B = -1$, $C = 6$	**A1**	
	Obtain a second value	**A1**	
	Obtain the third value	**A1**	In the form $\frac{A}{1-x}+\frac{Dx+E}{(2+3x)^2}$, where $A = 1$, $D = -3$ and $E = 4$ can score B1 M1 A1 A1 A1 as above.
		5	

19.

Question	Answer	Marks
6(a)	Carry out a relevant method to determine constants A and B such that $\frac{5a}{(2x-a)(3a-x)} = \frac{A}{2x-a} + \frac{B}{3a-x}$	**M1**
	Obtain $A = 2$	**A1**
	Obtain $B = 1$	**A1**
		3

20.

Question	Answer	Marks
9(a)	State or imply the form $\frac{A}{2+x} + \frac{B+Cx}{3+x^2}$	**B1**
	Use a correct method for finding a constant	**M1**
	Obtain one of $A = 4$, $B = 1$ and $C = -2$	**A1**
	Obtain a second value	**A1**
	Obtain the third value	**A1**
		5

21.

Question	Answer	Marks
4(a)	State or imply the form $\frac{A}{1+2x} + \frac{B}{4-x}$ and use a correct method to find a constant	**M1**
	Obtain one of $A = 4$ and $B = -1$	**A1**
	Obtain the second value	**A1**
		3

22.

Question	Answer	Marks	Guidance
4	State or imply the form $A+\frac{B}{2x-1}+\frac{C}{x-3}$	**B1**	$\frac{Dx+E}{2x-1}+\frac{F}{x-3}$ and $\frac{P}{2x-1}+\frac{Qx+R}{x-3}$ are also valid.
	Use a correct method for finding a constant	**M1**	
	Obtain one of $A=2$, $B=-3$ and $C=2$	**A1**	Allow maximum **M1A1** for one or more 'correct' values after **B0**.
	Obtain a second value	**A1**	
	Obtain the third value	**A1**	
	Alternative method for Question 4		
	Divide numerator by denominator	**M1**	
	Obtain $2\left[+\frac{Px+Q}{(2x-1)(x-3)}\right]$	**A1**	$\left[2+\frac{x+7}{(2x-1)(x-3)}\right]$
	State or imply the form $\frac{D}{2x-1}+\frac{E}{x-3}$	**B1**	
	Obtain one of $D=-3$ and $E=2$	**A1**	
	Obtain a second value	**A1**	
		5	

23.

Question	Answer	Marks	Guidance
8(a)	State or imply the form $\frac{A}{3x-1}+\frac{Bx+C}{x^2+3}$	**B1**	
	Use a correct method for finding a constant	**M1**	
	Obtain one of $A=1$, $B=0$ and $C=3$ from correct working	**A1**	A maximum of M1 A1 is available after B0.
	Obtain a second value from correct working	**A1**	
	Obtain the third value from correct working	**A1**	
		5	

24.

Question	Answer	Marks	Guidance
7(a)	State or imply the form $\frac{A}{x-2}+\frac{Bx+C}{2x^2+3}$	**B1**	If $1-\frac{A}{x-2}+\frac{Bx+C}{2x^2+3}$ or $\frac{A}{x-2}+\frac{C}{2x^2+3}$ B0 then M1 A1 (for $A=3$) still possible.
	Use a correct method for finding a constant	**M1**	
	Obtain one of $A=3$, $B=-1$ and $C=6$	**A1**	Allow all A marks obtained even if method would give errors if equations solved in a different order.
	Obtain a second value	**A1**	
	Obtain the third value	**A1**	
		5	

25.

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Question	Answer	Marks	Guidance
10(a)	State or imply the form $\frac{A}{1+x}+\frac{B}{2+x}+\frac{C}{(2+x)^2}$	B1	
	Use a correct method to find a constant	M1	
	Obtain one of $A=3$, $B=-1$ and $C=-2$	A1	SR after B0 can score M1A1 for one correct value
	Obtain a second value	A1	
	Obtain the third value	A1	$\frac{A}{1+x}+\frac{Dx+E}{(2+x)^2}$, where $A=3$, $D=-1$ and $E=-4$, is awarded B1 M1 A1 A1 A1 as above.

26.

Question	Answer	Marks	Guidance
10(a)	State or imply the form $\frac{A}{1+x}+\frac{Bx+C}{2+x^2}$	B1	
	Use a correct method for finding a constant	M1	
	Obtain one of $A=2$, $B=-1$ and $C=0$	A1	**SC**: A maximum of M1A1 is available for obtaining $A=2$ after scoring B0.
	Obtain a second value	A1	
	Obtain the third value	A1	
		5	

27.

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Question	Answer	Marks
11(a)	State or imply the form $\frac{A}{3-x}+\frac{Bx+C}{1+3x^2}$	B1
	Use a correct method to find a constant	M1
	Obtain one of $A=2$, $B=0$ and $C=1$	A1
	Obtain a second value	A1
	Obtain the third value	A1
		5

28.

Question	Answer	Marks	Guidance
11(a)	State or imply the form $\frac{Ax+B}{4+x^2}+\frac{C}{1+x}$	B1	
	Use a correct method for finding a coefficient	M1	$(Ax + B)(1 + x) + C(4 + x^2) = 5x^2 + x + 11$.
	Obtain one of $A = 2$, $B = -1$ and $C = 3$	A1	If error present in above still allow A1 for C.
	Obtain a second value	A1	
	Obtain the third value	A1	If $A = 0$ then max M1 A1 (for C).
		5	

29.

Question	Answer	Marks	Guidance
8(a)	State or imply the form $\frac{A}{2x+1}+\frac{B}{x+2}+\frac{C}{(x+2)^2}$	B1	Accept $\frac{A}{2x+1}+\frac{Dx+E}{(x+2)^2}$.
	Use a correct method for finding a constant	M1	
	Obtain one of $A = 1$, $B = -2$, $C = 3$	A1	For alternative form: $A = 1$, $D = -2$, $E = -1$.
	Obtain a second value	A1	
	Obtain the third value	A1	
		5	

30.

Question	Answer	Marks	Guidance
9(a)	State or imply the form $\frac{A}{1+2x}+\frac{B}{2-x}+\frac{C}{(2-x)^2}$	B1	Alternative form: $\frac{A}{1+2x}+\frac{Dx+E}{(2-x)^2}$
	Use a correct method for finding a coefficient	M1	e.g. $A(2 - x)^2 + B(1 + 2x)(2 - x) + C(1 + 2x)$ $= 2x^2 + 17x - 17$ and compare coefficients or substitute for x. $A(2 - x)^3 + B(1 + 2x)(2 - x)^2 + C(1 + 2x)(2 - x)$ $= 2x^2 + 17x - 17$ scores M0.
	Obtain one of $A = -4$, $B = -3$ and $C = 5$	A1	
	Obtain a second value	A1	
	Obtain the third value	A1	Extra term in partial fractions, then B0 unless recover at end. Allow the marks for any constants found correctly. Missing terms in partial fractions, B0 but M1A1 is available for a correct method that obtains at least one correct constant (e.g. cover-up rule) Max 2/5. Ignore any substitution back into their original expression. If alternative form used: $A = -4$, $D = 3$ and $E = -1$.
		5	

31.

Question	Answer	Marks	Guidance
10(a)	State or imply the form $\frac{A}{1+2x}+\frac{B}{3-x}+\frac{C}{(3-x)^2}$	**B1**	Alternative form: $\frac{A}{1+2x}+\frac{Dx+E}{(3-x)^2}$.
	Use a correct method to find a constant	**M1**	Incorrect format for partial fractions: Allow M1 and a possible A1 if obtain one of these correct values. Max 2/5 Allow M1 even if multiply up by $(1 + 2x)(3 - x)^3$.
	Obtain one of $A = 2$, $B = 2$ and $C = -3$	**A1**	Alternative form: obtain one of $A = 2$, $D = -2$ and $E = 3$.
	Obtain a second value	**A1**	
	Obtain the third value	**A1**	Do not need to substitute values back into original form.
		5	If $\frac{A}{1+2x}+\frac{B}{3-x}+\frac{Cx+D}{(3-x)^2}$ B0 but M1 A1 for A, A1 for B and A1 for C and D. If $C = 0$ then recovers B1 from above.

32.

Question	Answer	Marks	Guidance
10(a)	State or imply the form $\frac{A}{1-2x}+\frac{B}{2+x}+\frac{C}{(2+x)^2}$	**B1**	
	Use a correct method for finding a coefficient	**M1**	$A(2 + x)^2 + B(1 - 2x)(2 + x) + C(1 - 2x)$ $= 24x + 13$.
	Obtain one of $A = 4$, $B = 2$ and $C = -7$	**A1**	If errors in equating still allow A marks for A and C.
	Obtain a second value	**A1**	
	Obtain the third value	**A1**	Mark the form $\frac{A}{1-2x}+\frac{Dx+E}{(2+x)^2}$, where $A = 4$, $D = 2$ and $E = -3$, B1 M1 A1 A1 A1 as above. If there are extra term in partial fractions, that is 4 unknowns A, B, D and E then B0 unless recover at end, e.g. by setting $B = 0$. If B set to any value other than 0 and all coefficients correctly found to their new values then allow all A marks, but still B0 for partial fraction expression. Hence A1 for each coefficient, but nothing for coefficient set to specific value. Another case of extra term in partial fraction expression, namely + F, mark as above but need $F = 0$ to recover B1.
		5	

33.

Question	Answer	Marks	Guidance
9(a)	State or imply the form $\frac{Ax+B}{2+3x^2}+\frac{C}{2-x}$	**B1**	If incorrect partial fractions e.g. $A = 0$ or $Ax^2 + B$ then M1, A1 A0 for correct C. Only allow single A1 even if other coefficients correct. B1 recoverable by a correct form end statement.
	Use a correct method for finding a coefficient	**M1**	e.g. $(Ax + B)(2 - x) + C(2 + 3x^2)$ $= (3C - A)x^2 + (2A - B)x + (2B + 2C)$ $= 17x^2 - 7x + 16$.
	Obtain one of $A = -2$, $B = 3$ and $C = 5$	**A1**	If error present in above still allow A1 for C.
	Obtain a second value	**A1**	
	Obtain the third value	**A1**	Extra term in partial fractions, $D/(2 + 3x^2)$, that is 4 unknowns A, B, C and D then B0 unless recover at end, e.g. by setting B or $D = 0$. If B or D set to any value other than 0 and all coefficients correctly found to their new values then allow all A marks, but still B0 for partial fraction expression unless $B + D$ combined. Hence A1 for each coefficient, but nothing for coefficient set to specific value. Another case of extra term in partial fraction expression, namely $+ F$, mark as above but need $F = 0$ to recover B1.
		5	

34.

Question	Answer	Marks	Guidance
10(a)	State or imply the form $\frac{A}{2a+x}+\frac{B}{2a-x}+\frac{C}{5a-2x}$	**B1**	Allow if seen prior to assigning a value for a.
	Use a correct method for finding a coefficient	**M1**	
	Obtain one of $A = 1, B = 9, C = -16$	**A1**	
	Obtain a second value	**A1**	
	Obtain the third value	**A1**	
		5	**SC** $\frac{Dx+E}{4a\text{^}2-x\text{^}2}+\frac{C}{5a-2x}$ **B0 M1** and $C = -16$ **A1** Max 2/5. **SC** Allow **M1** only for other incorrect partial fraction.