Question	Answer	Marks	AO Element	Notes	Guidance
1	$[P =] \frac{100A}{100 + TR}$ final answer	**3**		**M1** for $100A = 100P + PRT$ or for $A = P\left(1 + \frac{RT}{100}\right)$ **M1** for $100A = P(100 + RT)$ or for $\frac{A}{1 + \frac{RT}{100}} = P$ or for $100A = P(1 + RT)$ after $100A = P + PRT$ as first step	
2(a)	**M1** for $\frac{1}{2} \times 4(x - 1) \times (2x + 5)[\sin 90] = 30$ oe **B1** for $8x^2 - 8x + 20x - 20$ or better **A1** for completion to $2x^2 + 3x - 20 = 0$	**3**		correct expansion of brackets with no errors or omissions seen	

Question	Answer	Marks	AO Element	Notes	Guidance
2(b)	**M2** for $(2x - 5)(x + 4)$ **B1** for 2.5 and –4 cao	**3**		Allow **M2** for e.g. $2x(x + 4) - 5(x + 4)$ then $2x - 5\,[= 0]$ and $x + 4\,[= 0]$ **M1** for $2x(x + 4) - 5(x + 4)$ or $x(2x - 5) + 4(2x - 5)$ or $(2x + a)(x + b)\,[= 0]$ where $ab = -20$ or $a + 2b = 3$ [a, b integers]	
2(c)	11.7 or 11.66 … or 11.67	**3**		**M2dep** for $(4(their2.5 - 1))^2 + (2 \times their2.5 + 5)^2$ or **M1dep** for $4(their2.5 - 1)$ or $2 \times their2.5 + 5$ OR **B1** for $\sqrt{20x^2 - 12x + 41}$ and **M1dep** for substituting $x = their\ 2.5$ into $\sqrt{20x^2 - 12x + 41}$ at any stage	

Question	Answer	Marks	AO Element	Notes	Guidance
3	$[\pm]\sqrt{\frac{A}{2\pi + y}}$ final answer	**2**		**M1** for $\frac{A}{2\pi + y} = x^2$ **M1** for correctly square rooting *their* expression in x^2 If zero scored **SC1** for $\frac{[\pm]\sqrt{A}}{2\pi + y}$	
4	$p = \frac{H + 3}{7}$ oe final answer	**2**		**M1** for correct first step	
5	61	**2**		**B1** for 55 or 6 or **M1** for $5 \times 11 - 2 \times -3$	
6	$[x =] \frac{2m}{k + 1}$	**4**		**M1** for $xk = 2m - x$ or $k = \frac{2m}{x} - 1$ **M1** for $xk + x = 2m$ or $k + 1 = \frac{2m}{x}$ **M1** for $x(k + 1) = 2m$	
7	$[\pm]\sqrt{k - s}$ final answer	**2**		**M1** for $t^2 = k - s$	

Question	Answer	Marks	AO Element	Notes	Guidance
8	$p = \frac{8r - 5}{r - 3}$ oe final answer	**3**		**M1** for correctly collecting terms in p on one side and terms not in p on the other side **M1** for correct factorising **M1** for correct division dependent on p appearing only once in a factorised expression Maximum **M2** for an incorrect final answer	
9	$\frac{2(s - ut)}{t^2}$ oe final answer	**3**		**M1** for correctly isolating term in a **M1** for correctly multiplying by 2 (or –2) **M1** for correctly dividing by t^2 $\left(\text{or } -t^2\right)$	
10	$[\pm]\sqrt{\frac{y - b}{a}}$ oe final answer	**3**		**M1** for correctly subtracting to isolate term in x^2 **M1** for correct division **M1** for the final stage of correctly finding the square root	
11	$v^3 - p$	**2**		**M1** for $v^3 = p + r$	

Question	Answer	Marks	AO Element	Notes	Guidance
12(a)	35	**1**			
12(b)	$\frac{3V}{A}$ or $3VA^{-1}$	**2**		**M1** for multiplying by 3 or for dividing by $\frac{1}{3}$ or **M1** for dividing by A	
13	$2x^3 - 5x^2 - 4x + 12$ final answer	**3**		**B2** for correct expansion of the three brackets unsimplified or for simplified four-term expression of correct form with three terms correct or **B1** for correct expansion of two of the three given brackets with at least three terms out of four correct	
14	$(1 + x)(1 - y)$ final answer	**2**		**B1** for $1 + x - y(1 + x)$ or $1 - y + x(1 - y)$	

Question	Answer	Marks	AO Element	Notes	Guidance
15	$2x\,(x+3y)\,(x-3y)$ final answer	**3**		**B2** for $2x\left(x^2-9y^2\right)$ or correctly factorising into two brackets e.g. $\left(2x^2+6xy\right)(x-3y)$, $\left(x^2-3xy\right)(2x+6y)$ or **B1** for $2\left(x^3-9xy^2\right)$ or $x\left(2x^2-18y^2\right)$ or for $(x+3y)\,(x-3y)$	
16	$(1-q)\,(1-a)$ or $(a-1)\,(q-1)$ final answer	**2**		**B1** for $1-q-a\,(1-q)$ or $1-a-q\,(1-a)$ or better or correct answer seen and spoilt	
17	$5\,(x-2y)\,(x+2y)$ final answer	**3**		**B2** for $(5x-10y)\,(x+2y)$ or $(x-2y)\,(5x+10y)$ or correct answer seen then spoilt or **B1** for $5\left(x^2-4y^2\right)$ or for $(x-2y)\,(x+2y)$	

Question	Answer	Marks	AO Element	Notes	Guidance
18	$(m+n)(t-1)$ final answer	**2**		**B1** for $m(t-1)+n(t-1)$ or $t(m+n)-[1](m+n)$ or correct answer seen and spoilt	
19	$(2m+3p)(1-4k)$ final answer	**2**		**B1** for $2m+3p-4k(2m+3p)$ or better or $2m(1-4k)+3p(1-4k)$ or correct answer seen and spoilt	
20(a)	**M1** for $(y+1)^3-y^3=5$ oe **B2** for $(y+1)^3=y^3+3y^2+3y+1$ soi **A1** for completion to $3y^2+3y-4=0$	**4**		**B1** for $(y+1)^2=y^2+y+y+1$ oe soi	

Question	Answer	Marks	AO Element	Notes	Guidance
20(b)	**B2** for $\frac{-3 \pm \sqrt{3^2 - 4\,(3)\,(-4)}}{2 \times 3}$ **B2** for 0.44	**4**		or **B1** for $\sqrt{3^2 - 4\,(3)\,(-4)}$ or for $\frac{-3 + \sqrt{\cdots}}{2 \times 3}$ or $\frac{-3 - \sqrt{\cdots}}{2 \times 3}$ **B1** for 0.758 or 0.7583...	
21(a)	**M1** for $3 - x + 3x - x^2$ or better or $3 + x + 3x + x^2$ or better or $9\ [-3x + 3x] - x^2$ **A1** for correct completion to $[\ y =]9 + 9x - x^2 - x^3$	**2**		At least 3 of the four terms correct or for the correct expansion of all three brackets with all 8 terms correct with no errors or omissions seen	

Question	Answer	Marks	AO Element	Notes	Guidance
21(b)	**B3** for $9 - 2x - 3x^2 = 0$ oe **B2** for $\frac{--2 \pm \sqrt{(-2)^2 - 4 \times -3 \times 9}}{2 \times -3}$ oe OR $-\frac{1}{3} \pm \sqrt{\frac{9}{3} + \left(\frac{1}{3}\right)^2}$ oe **B2** for –2.10 and 1.43 final answer	**7**		**B2** for $9 - 2x - 3x^2$ or **B1** for two correct terms **M1** for *their* derivative = 0 or stating $\frac{\mathrm{d}y}{\mathrm{d}x} = 0$ FT *their* derivative **B1FT** for $\sqrt{(-2)^2 - 4 \times -3 \times 9}$ or better or for $\frac{--2 + \sqrt{q}}{2 \times -3}$ or $\frac{--2 - \sqrt{q}}{2 \times -3}$ OR **B1** for $\left(x + \frac{1}{3}\right)^2$ **B1** for each or for answers –2.1 or –2.097 … and 1.4 or 1.430 to 1.431 or **SC1** for –2.097... **and** 1.43[0] to 1.431 seen in working or for –1.43 **and** 2.10 as final answer	

Question	Answer	Marks	AO Element	Notes	Guidance
21(c)	$[a =] -6$ $[b =] 17$	**3**		**B2** for either a correct or b correct or for $[a =] -5.04$ or -5.049 to -5.05 **and** $[b =] 16.9\ldots$ seen or **M1** for substitution of one of *their* solutions into $9 + 9x - x^2 - x^3$ oe or **SC1** for reversed answers, $a = 17$, $b = -6$	
22	$2x^3 + x^2 - 54x + 72$ final answer	**3**		**B2** correct expansion of three brackets unsimplified or for final answer of correct form with 3 out of 4 terms correct or **B1** correct expansion of two brackets with at least three terms out of four correct	
23	$5b - 2a$ final answer	**2**		**B1** for $5b$ or $-2a$ in final answer or for $5b - 2a$ seen	
24	$6x - 23$ final answer nfww	**2**		**M1** for $4x - 20$ or $-3 + 2x$	

Question	Answer	Marks	AO Element	Notes	Guidance
25	$3a\left(4a^2-7\right)$ final answer	**2**		**B1** for $3\left(4a^3-7a\right)$ or $a\left(12a^2-21\right)$ or for $3a\left(4a^2-7\right)$ seen then spoilt	
26	x^3+2x^2-5x-6 final answer	**3**		**B2** for correct expansion of three brackets unsimplified or for simplified expression of correct form with 3 out of 4 terms correct or **B1** for correct expansion of 2 of the 3 given brackets with at least 3 terms out of four correct	
27	$2x^3+7x^2-7x-30$ final answer	**3**		**B2** for unsimplified expansion with at most one error or for simplified four-term expression of correct form with three terms correct or **B1** for correct expansion of two brackets with at least three terms out of four correct	

Question	Answer	Marks	AO Element	Notes	Guidance
28	$3x^3 - 10x^2 - x + 12$ final answer	**3**		**B2** for correct unsimplified expansion or simplified expression with 3 terms correct in a 4-term expression of required form or **B1** for correct expansion of two of the brackets with at least 3 terms correct	
29	$\left(2x - y^2\right)\left(2x + y^2\right)$ final answer	**2**		**M1** for answer in form $(a + b)(a - b)$ or **B1** for correct answer seen	
30	$5(k + g)(3k + 3g - 4)$ final answer	**2**		**M1** for correct partial factorisation by 5 or $(k + g)$ isw eg $5\left(3k^2 + 6kg + 3g^2 - 4k - 4g\right)$ or $5\left(3(k + g)^2 - 4(k + g)\right)$ or $(k + g)(15(k + g) - 20)$ or $(5k + 5g)(3k + 3g - 4)$ or **B1** for correct answer seen	

Question	Answer	Marks	AO Element	Notes	Guidance
31	$(5a - b)\ (m + 2p)$ final answer	**2**		**M1** for $5a\ (m + 2p) - b\ (m + 2p)$ or $m\ (5a - b) + 2p\ (5a - b)$ or **B1** for correct answer seen	
32	[a =] 11 [b =] 121	**2**		**B1** for each	
33	$5\ (2x + 3y)\ (2x - 3y)$ final answer	**3**		**B2** for $(2x + 3y)\ (2x - 3y)$ or $(10x + 15y)\ (2x - 3y)$ or $(2x + 3y)\ (10x - 15y)$ or **B1** for $5\left(4x^2 - 9y^2\right)$	
34	$3x^3 - 7x^2 - 43x + 15$	**3**		**B2** for correct expansion and simplification of two of the brackets or **B1** for correct expansion of two brackets with at least 3 terms correct	

Question	Answer	Marks	AO Element	Notes	Guidance
35	$6x^2 - 7xy - 5y^2$	**2**		**M1** for 3 terms out of 4 from $6x^2 - 10xy + 3xy - 5y^2$	
36	$2a - 3b$ final answer	**2**		**B1** for answer $2a + kb$ or $ka - 3b$ or for $2a - 3b$ seen in working	
37	$3x^2 - 3x + 2$ final answer	**3**		**B2** for $x^2 + 2x + x + 2 + 2x^2 - 6x$ oe or **B1** for 3 correct terms of $x^2 + 2x + x + 2$ oe	
38(a)	$(p - q)(p + q)$ final answer	**1**			
38(b)	$\frac{7}{2}$ oe	**2**		**M1** for $2 \times (p + q) = 7$ or for $(2 + q)^2 - q^2 = 7$ or $p^2 - (p - 2)^2 = 7$	

Question	Answer	Marks	AO Element	Notes	Guidance
39	[a =] 2 [b =] –13	**3**		**B2** for either correct or $(x + 2)^2 - 13$ OR **M1** for $2a = 4$ soi **M1** for $a^2 + b = -9$ soi OR **M1** for $x^2 + ax + ax + a^2$ [$+b$] or better	
40	$2m + 1$	**2**		**B1** for $2m + c$ or $km + 1$ ($k \neq 0$)	
					[Total: 122]