Delta 3 – Unit 10 Revision Answers

Q1.

Question	Answer	Mark	Mark scheme	Additional guidance
	Proof	M1	for correct expressions for two consecutive even numbers eg $2n$ and $2n+2$	$(2n)^2 + (2n+2)^2$ $= 4n^2 + 4n^2 + 8n + 4$ $= 8n^2 + 8n + 4 = 4(2n^2 + 2n + 1)$
		M1	(dep M1) for expanding both expressions with at least one expansion fully correct eg $4n^2$ and $4n^2 + 4n + 4n + 4$ **or** for factorising both terms and intention to square correctly eg $(2n)^2$ and $2^2(n+1)^2$	**Or** $(2n)^2 + (2n-2)^2$ $= 4n^2 + 4n^2 - 8n + 4$ $= 8n^2 - 8n + 4 = 4(2n^2 - 2n + 1)$
		A1	complete proof	**Or** $(2n)^2 + (2n+2)^2$ $= 4(n)^2 + 4(n+1)^2$ $= 4(n^2 + (n+1)^2)$

Q2.

PAPER: 1MA0_2H					
Question		Working	Answer	Mark	Notes
	(a)	$y^2 - 2y - 5y + 10$	$y^2 - 7y + 10$	2	M1 for all 4 terms correct (condone incorrect signs) or 3 out of 4 terms correct with correct signs A1 cao
	*(b)	$(4n^2 + 2n + 2n + 1)$ $- (2n + 1)$ $= 4n^2 + 4n + 1 - 2n - 1$ $= 4n^2 + 2n$ $= 2n(2n + 1)$	Proof	3	M1 for 3 out of 4 terms correct in the expansion of $(2n+1)^2$ or $(2n+1)\{(2n+1) - 1\}$ A1 for $4n^2 + 2n$ or equivalent expression in factorised form C1 for convincing statement using $2n(2n+1)$ or $2(2n^2 + n)$ or $4n^2 + 2n$ to prove the result

Q3.

Question	Answer	Mark	Mark scheme	Additional guidance
	proof	C1	for writing an expression for an odd number, eg $2n + 1$ or $2n - 1$ (assuming n is any integer) **or** states n is even and eg $(n + 1)$ or $(n + 3)$ as odd numbers	
		C1	for a correct expression of the form $(2n + 1)^2 - (2n - 1)^2$ expanded eg $4n^2 + 12n + 9 - (4n^2 + 4n + 1)$ or $4n^2 + 4n + 1 - (4n^2 - 4n + 1)$ **or** $(2n + 1 + 2n - 1)(2n + 1 - (2n - 1))$ **or** when n is even and eg $(n^2 + 6n + 9) - (n^2 + 2n + 1)$ $(=4n + 8)$	Expansion of $(2n - 1)^2 - (2n + 1)^2$ oe is acceptable
		C1	for a correct simplified expression as a multiple of 8 eg $8n + 8$ or $8n$ **or** when n is even **and** eg $4n + 8$ **and** full explanation as to why $4(n+2)$ is always a multiple of 8	

Q4.

Question		Working	Answer	Mark	Notes
		$4n^2 + 12n + 3^2 - (4n^2 - 12n + 3^2)$ $= 4n^2 + 12n + 9 - 4n^2 + 12n - 9$ $= 24n$ $=8 \times 3n$	Proof	3	M1 for 3 out of 4 terms correct in expansion of either $(2n + 3)^2$ or $(2n - 3)^2$ **or** $((2n + 3) - (2n - 3))((2n + 3) + (2n - 3))$ A1 for $24n$ from correct expansion of both brackets A1 (dep on A1) for $24n$ is a multiple of 8 or $24n = 8 \times 3n$ or $24n \div 8 = 3n$

Q5.

Question	Working	Answer	Mark	Notes
	$n^2 - 2n + 1 + n^2 + n^2 + 2n +1$ $3n^2 + 2$	Proof	2	M1 for correct expansion of either $(n - 1)^2$ or $(n + 1)^2$ or $n^2 - 2n + 1$ or $n^2 + 2n + 1$ seen A1 for $3n^2 + 2$ from correct working

Q6.

Paper 1MA1: 1H					
Question	Working	Answer	Notes		
		proof	M1	for any two consecutive integers expressed algebraically eg $n + 1$ and n	for sight of $p^2 - q^2 = (p - q)(p + q)$
		(supported)	M1	(dep) for the difference between the squares of "two consecutive integers" expressed algebraically eg $(n + 1)^2 - n^2$	for deduction that $p - q = 1$
			A1	for correct expansion and simplification of difference of squares eg $2n + 1$	for linking these two statements eg substitution of 1 for $p - q$
			C1	for showing statement is correct (with supportive evidence) eg $n + n + 1 = 2n + 1$ and $(n + 1)^2 - n^2 = 2n + 1$	for fully stated proof and deduction eg $p^2 - q^2 = 1 \times (p + q) = p + q$

Q7.

Question	Working	Answer	Mark	Notes
		shows result	C1	shows expansion of the squares of any three consecutive numbers shown algebraically, e.g. $(4n^2 + 4n + 1)$ or $(4n^2 + 12n + 9)$ or $(4n^2 + 20n + 25)$
			C1	simplifies , e.g. $12n^2 + 36n + 35$
			C1	arrives at $12(n^2 + 3n + 2) + 11$ (oe) and concludes result