Question			Answer	Marks	AO	Guidance	
2	(a)	(i)	digit sum of 11 is 1 + 1 = 2	M1	1.1	Find digit sum for at least one prime number between 10 and 20	No need for any comment
			13: 1 + 3 = 4 17: 1 + 7 = 8 19: 1 + 9 = 10	A1*	2.1	Find digit sums for **all** prime numbers between 10 and 20	Condone any additional eg 15: 1 + 5 = 6 Allow **BOD** if not explicitly stated which number is being considered
			which are even numbers	A1dep*	2.4	Conclude appropriately	Comment needed, even if just showing that all numbers can be written as 2 x * Condone just 'true' **A0** if any additional numbers included eg non-primes / primes outside 10 to 20
				[3]			
2	(a)	(ii)	eg 23: 2 + 3 = 5, which is not even	B1	2.3	State both counterexample and reason Either the sum or the evaluation must be seen eg for 23, we need at least one of 2 + 3 or 5	Could state either 'not even' or 'odd' Accept 'not multiple of 2' or 'not divisible by 2', but **B0** for just 'not true' Allow **BOD** if any additional numbers are included eg non-prime or those that have an even digit sum, as long as they draw attention to the counterexample
				[1]			
2	(b)		$(2n + 5)^2 - (2n + 3)^2$ $= (4n^2 + 20n + 25) - (4n^2 + 12n + 9)$	M1	2.1	Expand to obtain two 3 term quadratics, both with at least two terms correct	Condone 'invisible' brackets eg **M1** for $4n^2 + 20n + 25 - 4n^2 + 12n + 9$ Could be 4 terms eg $4n^2 + 10n + 10n + 25$
			$= 8n + 16$	A1*	1.1	Correct simplified expression ie like terms collected, from correct expansions	Could be implied by going from expanded quadratics straight to $8(n + 2)$ Allow **BOD A1** if following an earlier slip
			$= 8(n + 2)$ (hence both are multiples of 8)	A1dep*	2.4	Show that this is a multiple of 8	Identify common factor (condone just writing it as $8(n + 2)$) or justify term by term (ie 8 and 16 are both multiples of 8) Allow **BOD A1** if following an earlier slip

Question			Answer	Marks	AO	Guidance	
2	(b)		**Alternative method** **Considering both odd and even**			Condone using $2n$ and $2n + 1$	
			even: $n = 2p$ $(4p + 5)^2 - (4p + 3)^2$ $= (16p^2 + 40p + 25) - (16p^2 + 24p + 9)$ odd: $n = 2p + 1$ $(4p + 7)^2 - (4p + 5)^2$ $= (16p^2 + 56p + 49) - (16p^2 + 40p + 25)$	**M1**	**2.1**	Expand **both** odd and even expressions to obtain two 3 term quadratics, both with at least two terms correct	Condone 'invisible' brackets Could use odd as $2p - 1$
			$= 16p + 16$ (for n even) $= 16p + 24$ (for n odd)	**A1***	**1.1**	**Both** simplified expressions correct ie like terms collected, from correct expansions	Could be implied by going from expanded quadratics straight to factorised form) Allow **BOD A1** if following an earlier slip
			$= 8(2p + 2)$ $= 8(2p + 3)$ hence both are multiples of 8	**A1dep***	**2.4**	Explain why each is a multiple of 8	Identify common factors (it is sufficient to just write as $8(2p + 2)$ and $8(2p + 3)$ or justify term by term (ie 16 and 24 are both multiples of 8) Allow **BOD A1** if following an earlier slip
				[3]			