Q	Marking Instructions	AO	Marks	Typical Solution
9(a)	Uses S_n for arithmetic sequence with $n = 6$ or $n = 36$	AO1.1a	M1	$S_6 = 3(2a+5d)$ $= 6a+15d$ $S_{36} = 18(2a+35d)$ $= 36a+630d$
	Finds correct expressions for S_6 and S_{36}	AO1.1b	A1	
	Forms equation in a and d using *their* S_{36} = (*their* S_6)^2	AO3.1a	M1	
	Expands quadratic and collects like terms to obtain printed answer Only award for completely correct solution with no errors	AO2.1	R1	$36a+630d = (6a+15d)^2$ $36a+630d = 36a^2+90ad+90ad+225d^2$ $4a+70d = 4a^2+20ad+25d^2$
(b)	Uses u_n for arithmetic sequence with $n = 6$	AO1.1b	B1	$a+5d = 25 \Rightarrow d = \frac{25-a}{5}$
	Eliminates a or d using *their* 'a+5d = 25' and the printed result in part (a) to obtain a quadratic in one variable	AO1.1a	M1	$4a+70\left(\frac{25-a}{5}\right) = 4a^2+20a\left(\frac{25-a}{5}\right)+25\left(\frac{25-a}{5}\right)^2$ $4a+350-14a = 4a^2+100a-4a^2+625-50a+a^2$
	Obtains correct quadratic equation Need not be simplified	AO1.1b	A1	$350-10a=100a+625-50a+a^2$
	Solves their quadratic a =-5, a = -55 (*or* d=6, d=16)	AO1.1a	M1	$a^2+60a+275=0$
	Deduces min value a=-55 **NMS** a=-55 5/5	AO3.2a	A1	a =-5, a = -55 (*or* d=6, d=16) a = -55
	Total		**9**	