Q	Marking Instructions	AO	Marks	Typical solution
8(a)	Uses rules of indices to express $2^{(2x+3)}$ in terms of y or 16^x in terms of y, must see an intermediary step, either $(2^4)^x$ or $(4^2)^x$, not just $16^x = (2^{2x})^2$	1.1a	M1	$2^{(2x+3)} = 2^{2x} \times 2^3 = 8y$ $16^x = (2^4)^x = (2^{2x})^2 = y^2$ $y^2 - 8y - 9 = 0$
	Completes rigorous solution expressing both terms in terms of y Condone working backwards from quadratic in y to both terms in x. Be convinced	2.1	R1	
	Subtotal		**2**	
8(b)	Solves the equation in terms of 2^{2x} (PI by seeing either $2^{2x} = 9$ or $2^{2x} = -1$)	1.1a	M1	$y = 9$ or $y = -1$ $2^{2x} = 9$ or $2^{2x} = -1$
	States that $2^{2x} = -1$ has no (real) solutions (PI by negative numbers do not have a square root)	2.4	E1	$2^{2x} = -1$ has no solutions
	Uses logs to solve $2^{2x} = 9$ OE Or Square roots first then correctly takes logs Accept $\log_2 9$ or $\log_4 9$ seen as evidence for M1	1.1a	M1	$2x = \log_2 9$ $x = \frac{1}{2}\log_2 9$ $= \log_2 9^{\frac{1}{2}}$ $= \log_2 3$
	Completes rigorous solution. Must include justification for 9 becoming 3	2.1	R1	
	Subtotal		**4**	
	Question Total		**6**	