Question Number	Scheme	Marks
3(a)	$\frac{\mathrm{d}v}{\mathrm{d}t}=2t-4$	M1
	$\text{Accel}=2\ \left(\text{m/s}^2\right)$	A1 (2)
(b)	$s=\int_0^6\left(t^2-4t+7\right)\mathrm{d}t=\left[\frac{t^3}{3}-2t^2+7t\right]_0^6$	M1A1
	$=\frac{6^3}{3}-2\times6^2+7\times6=42\ (\text{m})$	dM1 A1cao (4)
		[6]
(a)		
M1	Attempt to differentiate the expression for v. Power of t to decrease in at least one term and increase in none.	
A1	Substitute t = 3 and obtain correct acceleration – units may be missing	
(b)		
M1	Attempt to integrate the expression for v. Power of t to increase in at least one term and decrease in none. Ignore limits if shown. Constant not needed for indefinite integration.	
A1	Correct integration. Limits/constant not needed.	
dM1	**Either** substitute the limits 0 and 6 **or** use s = 0, t = 0 to obtain a value for the constant and substitute t = 6 in the complete expression. (Substitution of 0 can be implied if the result would have been 0) Depends on the previous M mark If more values of t are substituted **and results used** award M0	
A1cao	S = 42 (m)	
NB	Ans 42 w/o working scores 4/4 (Done on a calculator)	
4	$(2x+5)^2=(3x-1)^2+(5x)^2-2\times(3x-1)\times5x\cos60°$	M1A1
	$15x^2-21x-24(=0)\quad\left(5x^2-7x-8=0\right)$	A1
	$x=\frac{21\pm\sqrt{21^2+4\times15\times24}}{30}$	M1
	$x=2.1456......\ (\text{or }-0.7456...)$	
	$\therefore\ x=2.15$	A1 [5]
M1	Use the cosine rule in either form. Rule to be correct either by quoting and using the general formula or by implication from a correct substitution.	
A1	Correct substitution in their cosine rule.	
A1	Simplify to obtain a 3TQ. Terms in any order. $=0$ may be missing	
M1	Solve their 3TQ by formula (correct general formula or correct substitution for their equation) or completing the square. Reach a positive value for x. Negative need not be seen. **Calculator solutions:** Correct answer from correct equation scores M1A1, otherwise M0A0	
A1cao	Correct value for x. **Must** be 3 sf Negative value (if shown) must be eliminated or positive clearly identified as the required value..	