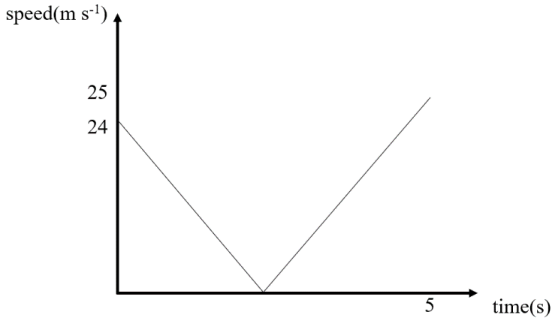
QUESTION NUMBER	SCHEME	MARKS
6(a)	A to B: $V^2 = 24^2 + 2(-g)(-2.5)$	M1 A1
	OR: e.g. $0 = 24^2 - 2gh$ and $V^2 = 2g(h + 2.5)$ oe	
	$V = 25$	A1
		(3)
6(b)	Some possible equations in t: $25 = -24 + gt$ $2.5 = \frac{(25 + (-24))t}{2}$ $2.5 = -24t + \frac{1}{2}gt^2$ $2.5 = 25t - \frac{1}{2}gt^2$ Or they may find t_{UP} $\left(\frac{24}{g}\right)$ and t_{DOWN} $\left(\frac{25}{g}\right)$ AND add	M1 A1
	$t = 5$ (s)	A1
		(3)
6(c)	From A to C: $10 = 24t + \frac{1}{2}(-g)t^2$	M1 A1
Complete method to find the required time: e.g. solving the above quadratic and finding the positive difference in the roots **N.B.** Allow this mark if they solve their quadratic, and give the answer as a range of values: $t_1 \leqslant t \leqslant t_2$		M1
	4, 4.0 or 3.98 (s)	A1
	ALT 1: From A to C: $W^2 = 24^2 - 2\times 10g$	M1A1
	$0 = W - g(\frac{1}{2}t)$	M1
	4.0 or 3.98 (s)	A1
	ALT 2: From A to C: $W^2 = 24^2 - 2\times 10g$	M1A1
	$0 = Wt + \frac{1}{2}(-g)t^2$	M1
	4.0 or 3.98 (s)	A1
		(4)
6(d)		B1 shape B1 ft labels
		(2)
		(12)

	Notes for question 6	
(a)		
M1	Complete method to find an equation in V only. Condone sign errors.	
A1	Correct equation in V only using g. Note the sign of 2.5 and g should be the same.	
A1	cao	
(b)		
M1	Complete method to find an equation in t only. Condone sign errors.	
A1	Correct equation in t only using g.	
A1	cao	
(c)		
M1	Forming an equation or equations which could lead to a relevant time. Condone sign errors.	
A1	Correct equation(s)	
M1	Complete method to find the required time.	
A1	cao	
(d)		
B1	Correct shape. It should appear symmetrical with regards to gradients but the end point should be higher than the start point. Vertex on horizontal axis.	
B1ft	Correct labels (24, 25 and 5), ft on their answers to (a) and (b), provided they are positive. **N.B.** ignore an incorrect time when $v = 0$. **Neither mark available if using a velocity-time graph**.	