Question	Answer	Marks	AOs		Guidance
9 (i)	Vertical motion $u = 0$ $s = ut + \frac{1}{2}at^2$	B1	3.3	Using $u = 0$ in the vertical direction to model horizontal motion soi	
	$-5 = 0 - \frac{9.8}{2}t^2$	M1	3.4	Using suvat equation(s) to find <i>t</i> . Allow sign errors and incorrect	
	$t = \sqrt{\frac{10}{9.8}} = 1.01 \text{ s}$	A1 [3]	1.1b	Must follow from working where the signs are consistent.	
(ii)	x = 14t $y = 5 - 4.9t^2$	B1 B1	3.3 3.3	May be implied May be implied	
	So cartesian equation is $y = 5 - 4.9 \left(\frac{x}{14}\right)^2 \left[=5 - \frac{x^2}{40}\right]$	M1 A1 [4]	1.1a 1.1b	Attempt to eliminate <i>t</i> Any form	
(iii)	EITHER When $y = 2$ $y = 5 - \frac{x^2}{40} = 2$ m $\frac{x^2}{40} = 3$	M1	3.4	Using their equation of trajectory and $y = 2$	<b>SC2</b> for $d < \sqrt{80}$ [= 8.94] <b>SC1</b> for $d = \sqrt{80}$ [= 8.94]
	$x = \sqrt{120} = 10.9544$ [0<] $d < 11.0$ m	A1 E1 [3]	1.1b 3.2a	Must be 11.0 or better Allow "Fence must be less than 10.95 m from the origin." FT their value	
(iii)	OR When $y = 2 \ 2 = 5 - 4.9t^2$ t = 0.782 When $t = 0.782 \ x = 14 \times 0.782 = 10.95$ [0 < ]d < 11.0  m	M1 A1 A1 [3]		Both steps required for M1 Must be 11.0 or better Allow "Fence must be less than 10.95 m from the origin."	Allow if the origin is taken to be at window height and the top of the wall is 3m below the window. Signs must be consistent for A1