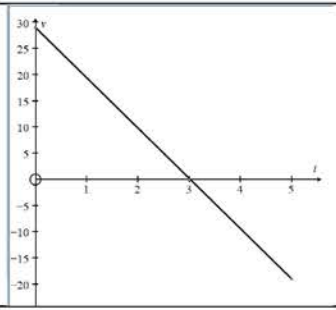
Question			Answer	Marks	AOs	Guidance	
10	(a)		Time when $v = 0$ given by $0 = 29.4 - 9.8t$, so $t = 3$ s	E1 [1]	2.1	Using *suvat* equation(s) leading to correct value for t with $v = 0$	Allow for verifying that $t = 3$ gives $v = 0$ if identified as the maximum point oe
10	(b)		 	B1 B1 [2]	1.1b 1.1b	straight line with negative gradient through either (3, 0) or (0, 29.4) Both (3, 0) and (0, 29.4) clearly seen Must include negative values of v for $t > 3$	
10	(c)		When $t = 5$, $v = 29.4 - 9.8 \times 5$ $v = -19.6$ Speed is 19.6 m s^{-1}	M1 A1 A1 [3]	1.1a 1.1b 1.1b	Using *suvat* equation(s) leading to a value for v with $t = 5$. Allow sign errors May be implied by 19.6 seen FT their negative velocity	If motion from the highest point considered $u = 0$, $t = 2$, $g = +9.8$ then $v = 19.6$ is fully correct. Allow M1A1A0 if $29.4 - 9.8 \times 5 = 19.6$ seen
10	(d)		Max height unchanged so $u_y = 29.4$ m s^{-1} Time to max height unchanged, so 3 s	B1 B1 [2]	3.1b 3.3	Allow if calculated from $y = 44.1$ m	
10	(e)		$u_x \times 3 = 48$ $u = \sqrt{u_x^2 + u_y^2} = \sqrt{16^2 + 29.4^2} = 33.5$ $\tan\alpha = \dfrac{u_y}{u_x} = \dfrac{29.4}{16}$ giving $\alpha = 61.4°$	M1 M1 A1 [3]	1.1a 1.1b 1.1b	Using (their) $t = 3$ to find u_x Combining their components to find either one of u and α Both values correct	