Question	Answer	Marks	Guidance
(a)	Forward force exerted by cyclist driving force = $\frac{180}{6}$ [= 30 N]	**B1**	
	DF – F – 70g sin α = 70 × – 0.2	**M1**	Attempt Newton's second law, 4 terms required. A value must be used for $\sin\alpha$.
	$30 - F - 70g \times 0.05 = 70 \times -0.2$	**A1**	Correct equation
	$F = 9$	**A1**	From exact working only
		4	
(b)	$\frac{180}{v} - F - 70g \times \sin\alpha = 0$	**M1**	Apply Newton's second law up the hill with $a = 0$. Must have 3 relevant terms using their F from **4(a)**. A value for $\sin\alpha$ must be used.
	$v = 4.09$ m s^{-1}	**A1**	Allow $\frac{45}{11}$
		2	