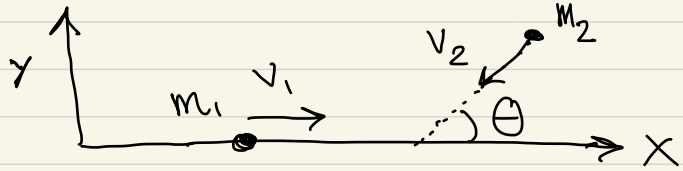
Quiz: Two objects with masses m_1 and m_2 travel with speeds v_1 and v_2 as shown below. The two objects collide and stick together. What is the velocity of the system after the collision?

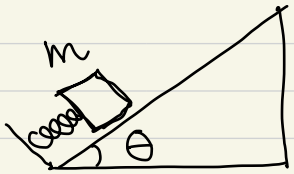


	v_x	v_y
(a)	$m_1 v_1 + m_2 v_2 \cos\theta$	$m_2 v_2 \sin\theta$
(b)	$m_1 v_1 - m_2 v_2 \cos\theta$	$-m_2 v_2 \sin\theta$
(c)	$\frac{1}{m_1+m_2}(m_1 v_1 + m_2 v_2 \cos\theta)$	$\frac{1}{m_1+m_2}(m_2 v_2 \sin\theta)$
(d)	$\frac{1}{m_1+m_2}(m_1 v_1 - m_2 v_2 \cos\theta)$	$\frac{1}{m_1+m_2}(-m_2 v_2 \sin\theta)$

(e) None of above

Quiz

A block of mass m is pushed a distance d against a spring on an inclined plane with no friction and released from rest. If the spring force is given by $F(x) = \alpha x + \beta x^3$, find the value of d such that the mass will come to rest at the natural rest length of the spring.



(a) $\frac{1}{2}\alpha d^2 + \frac{1}{4}\beta d^4 = mgd\sin\theta$

(b) $\frac{1}{2}\alpha d^2 - \frac{1}{4}\beta d^4 = mgd\sin\theta$

(c) $\frac{1}{2}\alpha d^2 + \frac{1}{4}\beta d^4 = mgd\cos\theta$

(d) $-\frac{1}{2}\alpha d^2 - \frac{1}{4}\beta d^4 = mgd\cos\theta$

(e) None of above