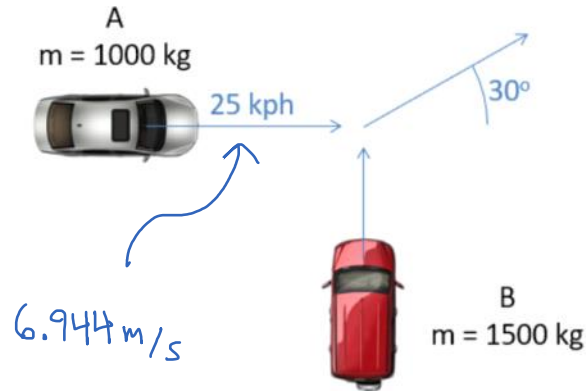


Problem 1

Two cars collide at an intersection as shown below. The cars become entangled with one another sticking together after the impact. Based on the information given below on the initial velocities and assuming both cars slide away from the crash at the 30 degree angle as shown, what must the initial velocity of car B been before the impact?



$$m_A v_{Aix} + \cancel{m_B v_{Bix}} = m_{A+B} v_{fx}$$

$$\cancel{m_A v_{Aiy}} + m_B v_{By} = m_{A+B} v_{fy}$$

$$(1000 \text{ kg})(6.944 \text{ m/s}) = (2500 \text{ kg}) v_f \cos(30)$$

$$v_f = 3.207 \text{ m/s}$$

$$(1500 \text{ kg})(v_{By}) = (2500 \text{ kg}) v_f \sin(30)$$

$$v_{By} = 2.673 \text{ m/s} \rightarrow \boxed{9.622 \text{ kph}}$$