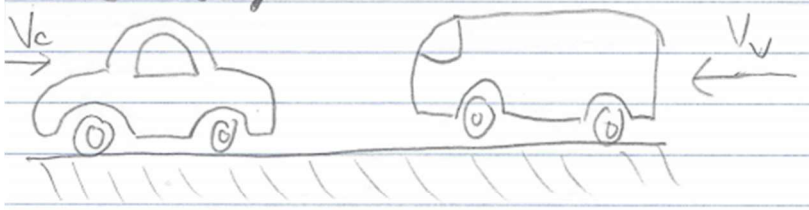
20-P-MOM-DY-Q 5

After years of hard work and research, engineers create the world's strongest car and van. To showcase their strength, the engineers bounce the vehicles off each other in a head on collision. The 2000kg car and 3000kg van have an initial speed of 10 m/s and 8 m/s respectively. Determine the final velocities if the coefficient of restitution is $e = 0.7$.



$$e = \frac{(V_B)_2 - (V_A)_2}{(V_A)_1 - (V_B)_1}$$

$V_A = V_c \quad V_B = V_v$

$$(V_B)_2 = [(V_A)_1 - (V_B)_1]e + (V_A)_2$$

$$(2000)(10) - (3000)(8) = m_c(V_A)_2 + m_v(V_B)_2$$

$$(V_A)_2 = -8.36 \text{ m/s} \quad (V_B)_2 = 4.24 \text{ m/s}$$