Conservation of Linear Momentum

-two types of collisons: elastic and inelastic
-elastic collisions are when momentum is conserved
-inelastic collisions are when it is not conserved

LAW OF CONSERVATION OF MOMENTUM

The sum of the momenta of two objects before a collision is equal to the sum of their momenta after they collide.

$$m_A\vec{v_A} + m_B\vec{v_B} = m_A\vec{v'_A} + m_B\vec{v'_B}$$

Quantity	Symbol	SI unit
mass of object A	m_A	kg (kilograms)
mass of object B	m_B	kg (kilograms)
velocity of object A before the collision	$\vec{v_A}$	$\frac{m}{s}$ (metres per second)
velocity of object B before the collision	$\vec{v_B}$	$\frac{m}{s}$ (metres per second)
velocity of object A after the collision	$\vec{v'_A}$	$\frac{m}{s}$ (metres per second)
velocity of object B after the collision	$\vec{v'_B}$	$\frac{m}{s}$ (metres per second)

A 1.7×10^4 kg railcar collides with a stationary car that has a mass of 2.0×10^4 kg. Just before the collision the first car was travelling at 5.4m/s. If the two cars stick together after the collision, what is the velocity of the two boxcars immediately after colliding.