Special Cases of elastic collisions:

Match each equation with its special case :

missed given		$\frac{p_{f1,x}^2}{2m_1} + \frac{p_{f2,x}^2}{2m_2} = \frac{p_{i1,x}^2}{2m_1} + \frac{p_{i2,x}^2}{2m_2}.$
Equal masses		$v_{f1,x} = \left(\frac{m_1 - m_2}{m_1 + m_2}\right) v_{i1,x} + \left(\frac{2m_2}{m_1 + m_2}\right) v_{i2,x}$ $v_{f2,x} = \left(\frac{2m_1}{m_1 + m_2}\right) v_{i1,x} + \left(\frac{m_2 - m_1}{m_1 + m_2}\right) v_{i2,x}.$
Kinetic energy conservation		$v_{f1,x} = v_{i2,x}$ $v_{f2,x} = v_{i1,x}.$
Object 1 is at rest		$v_{f1,x} = \left(\frac{2m_2}{m_1 + m_2}\right) v_{i2,x}$ $v_{f2,x} = \left(\frac{m_2 - m_1}{m_1 + m_2}\right) v_{i2,x}.$

LIVEWORKSHEETS