1. UFF

The Person will be seeing a Force og $m_g \cdot g$ which is equal to $m_i \cdot a + F_{scale}$ meaning the Force, the scale and the person interact with. So the Force, the scale sees is $F_{scale} = -m_i \cdot a + m_g \cdot g$

2. energy conservation

The total momentum is given by $p = p_1 + p_2$. This is preserved, if $\frac{\partial p}{\partial t} = 0$:

$$\frac{\partial p_1}{\partial t} = F_{1,2} = -G\, m_{1,p} m_{2,a} \frac{x_1 - x_2}{|x_1 - x_2|^3}$$
$$\frac{\partial p_2}{\partial t} = F_{2,1} = -G\, m_{2,p} m_{1,a} \frac{x_2 - x_1}{|x_2 - x_1|^3}$$

So that now we have equivalences:

$$\begin{aligned}
& \frac{\partial p}{\partial t} = 0 \\
\Leftrightarrow \quad & F_{1,2} + F_{2,1} = 0 \\
\Leftrightarrow \quad & -G \frac{1}{|x_2 - x_1|^3} \left(m_{1,p} m_{2,a} (x_1 - x_2) + m_{2,p} m_{1,a} (x_2 - x_1) \right) = 0 \\
\Leftrightarrow \quad & m_{1,p} m_{2,a} = m_{2,p} m_{1,a} \\
\Leftrightarrow \quad & \frac{m_{1,p}}{m_{1,a}} = \frac{m_{2,p}}{m_{2,a}}
\end{aligned}$$