An elevator accelerates downward at $2.4\,\frac{\text{m}}{\text{s}^2}$. What force does the elevator's floor exert on a 52–kg passenger?

$$\vec{F}_{net} = m\vec{a}$$

$$F_{floor} - mg = ma_y$$

$$F_{floor} = mg + ma_y$$

$$= m(g + a_y)$$

$$= (52\,\text{kg})\left(9.8\,\tfrac{\text{m}}{\text{s}^2} - 2.4\,\tfrac{\text{m}}{\text{s}^2}\right)$$

$$= 385\,\text{kg}\,\tfrac{\text{m}}{\text{s}^2} = 3.8\times10^2\,\text{N}$$

$\hookrightarrow$ N

$a_y = -2.4\,\frac{\text{m}}{\text{s}^2}$