22. The stopping force $\vec{F}$ and the path of the passenger are horizontal. Our $+x$ axis is in the direction of the passenger's motion, so that the passenger's acceleration ("deceleration") is negative-valued and the stopping force is in the $-x$ direction: $\vec{F} = -F$. We use Eq. 2-16 and SI units (noting that $v = 0$ and $v_0 = 53(1000/3600) = 14.7$ m/s).

$$v^2 = v_0^2 + 2a\Delta x \quad \Longrightarrow \quad a = -\frac{v_0^2}{2\Delta x} = -\frac{14.7^2}{2(0.65)}$$

which yields $a = -167$ m/s^2. Assuming there are no significant horizontal forces other than the stopping force, Eq. 5-1 leads to

$$\vec{F} = m\vec{a} \quad \Longrightarrow \quad -F = (41\,\text{kg})\left(-167\,\text{m/s}^2\right)$$

which results in $F = 6.8 \times 10^3$ N.