4. A person who has a mass of 65 kg goes on the Sky Tower ride at an amusement park. The ride is simply a free fall from the top of a tower into a net below. If the person reaches a final velocity of 24.6 m/s just before hitting the net, from what height did the rider drop? Ignore friction with the air.

$E_g = mg\Delta h$

~~E_g or g~~ ~~E_g~~ $E_k = \frac{1}{2}mv^2$

$\boxed{31\ m}$

$2.0 \times 10^4 = (65\ kg)(9.8\frac{m}{s^2})\Delta h$

$E_k = \left(\frac{1}{2}\right)(65\ kg)\left(24.6\frac{m}{s}\right)\left(24.6\frac{m}{s}\right)$

$\Delta h = \dfrac{2.0 \times 10^4}{(65\ kg)(9.8\frac{m}{s^2})}$

$E_k = 19667.7$

$= 2.0 \times 10^4\ \boxed{\frac{kg\ m^2}{s^2}} \rightarrow J$

$\Delta h = 31.39$

this energy $=$ the potential energy

$\boxed{\Delta h = 3.11 \times 10^1\ m}$

$\hookrightarrow$ change in height is $3.1 \times 10\ m$