65. We estimate the planet to have radius $r = 10$ m. To estimate the mass m of the planet, we require its density equal that of Earth (and use the fact that the volume of a sphere is $4\pi r^3/3$).

$$\frac{m}{4\pi r^3/3} = \frac{M_E}{4\pi R_E^3/3} \implies m = M_E\left(\frac{r}{R_E}\right)^3$$

which yields (with $M_E \approx 6 \times 10^{24}$ kg and $R_E \approx 6.4 \times 10^6$ m) $m = 2.3 \times 10^7$ kg.

(a) With the above assumptions, the acceleration due to gravity is

$$a_g = \frac{Gm}{r^2} = \frac{\left(6.7 \times 10^{-11}\right)\left(2.3 \times 10^7\right)}{10^2} = 1.5 \times 10^{-5}\ \mathrm{m/s^2}\ .$$

(b) Eq. 14-27 gives the escape speed:

$$v = \sqrt{\frac{2Gm}{r}} \approx 0.02\ \mathrm{m/s}\ .$$