32. (a) We adapt Eq. 43-20:

$$N_{\mathrm{Pu}} = \left(\frac{0.002\,\mathrm{g}}{239\,\mathrm{g/mol}}\right)\left(6.02\times 10^{23}\,\mathrm{nuclei/mol}\right) \approx 5\times 10^{18}\ \mathrm{nuclei}\ .$$

(b) Eq. 43-19 leads to

$$R = \frac{N\ln 2}{T_{1/2}} = \frac{5\times 10^{18}\ln 2}{2.41\times 10^{4}\,\mathrm{y}} = 1.4\times 10^{14}/\mathrm{y}$$

which is equivalent to $4.6\times 10^{6}/\mathrm{s} = 4.6\times 10^{6}$ Bq (the unit becquerel is defined in §43-3).