(4.2) How many times larger is the nucleon binding energy in ^{24}Na than the electron binding energy when the
ionization potential of the sodium atom is 5.14 V.

$A := 24$ $Z := 11$ $N := A - Z$ (eqn. (3.1)) $N = 13$

Data for the constants in eqn. (3.8) taken from the middle of p. 51 are:

$a_v := 15.5$ $a_a := 23$ $a_c := 0.72$ $a_s := 16.8$ $a_d := 34$ $s := -1$

The binding energy of the loosest bound electron (in eV) is the same as the ionization potential (in V), e_b:

$e_b := 5.14$ eV

$$E_B := \left[a_v \cdot A - a_a \cdot \frac{(N-Z)^2}{A} - a_c \cdot \frac{Z^2}{A^{\frac{1}{3}}} - a_s \cdot A^{\frac{2}{3}} \right] + s \cdot \frac{a_d}{A^{\frac{3}{4}}} \quad \text{(eqn. (3.8))}$$

$E_B = 195.047$ MeV $\frac{E_B}{A} = 8.127$ MeV/u (this is the average nucleon binding energy)

$$ratio := \frac{\frac{E_B}{A} \cdot 10^6}{e_b} \qquad ratio = 1.581 \cdot 10^6$$