

Solutions

Each answer shows the steps, then the **result**.

2.1

- fission is the splitting of a heavy nucleus; fusion is the joining of light nuclei

2.2

- the time taken for half of the radioactive nuclei to decay

2.3

- $E = mc^2 = (2.0 \times 10^{-3})(3.0 \times 10^8)^2 = 1.8 \times 10^{14} \text{ J}$

3.1 B

3.2 B

3.3

(a)

- after two half-lives: $80 \rightarrow 40 \rightarrow 20 \text{ g}$

(b)

- you cannot predict which nucleus will decay or when — only the probability