

Solutions

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

2.1

- nuclear fusion (of hydrogen nuclei into helium)

2.2

- distance (the distance light travels in one year)

3.1 B

- redshift shows galaxies are receding — the Universe is expanding

3.2

(a) it swells into a red giant

- throws off its outer layers as a planetary nebula
- leaving a white dwarf

(b) a white dwarf

3.3

(a) $\text{age} \approx 1/H_0$

$$\text{age} = \frac{1}{2.2 \times 10^{-18} \text{ s}^{-1}} = 4.5 \times 10^{17} \text{ s}$$

(b) the cosmic microwave background radiation (CMBR)