2017 Ph H1 Q5

Section: Our Dynamic Universe
Topic: The Expanding Universe

A galaxy has a recessional velocity of $0.30c$.
What is its distance from Earth according to Hubble's Law?

Step-by-step solution:

- **Given:**
  - $v = 0.30c = 9.00 \times 10^7\ \text{m/s}$
  - $H_0 = 2.3 \times 10^{-18}\ \text{s}^{-1}$
- **Hubble's Law:**

$$v = H_0 d \quad \Rightarrow \quad d = \frac{v}{H_0} = \frac{9.00 \times 10^7}{2.3 \times 10^{-18}} = 3.91 \times 10^{25}\ \text{m}$$

Final Answer:
B

Revision Tips:

- $v = H_0 d$ gives the distance to galaxies moving away from us
- Use $c = 3.00 \times 10^8\ \text{m/s}$, and express answers in standard form
- Be alert to the **units** for H_0 — always in s^{-1}