Chapter 18

Life in the Universe
High Five?

Because silicon is so heavy, it can’t be as flexible with its bonding points.
Which one of the following is NOT one of the six chemical elements commonly found in living organisms?

a. Helium
b. Phosphorus
c. Hydrogen
d. Nitrogen
Which of these does NOT support the idea that there might be other forms of life in the Solar System?

a. Mars had a warmer and wetter past.
b. Enceladus is too far from the Sun for water to be liquid.
c. Europa has oceans under its surface.
d. Titan has organic material.
Life on a Known Exoplanet?

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Mass = 0.173 Jupiter Masses
Semimajor axis (avg. distance from star) = 0.774 AU
Orbital Period = 261.2 days
Orbital eccentricity = 0.32
Mass of parent star = 0.905 Solar Masses
Temp of parent star = 5196 K

Masses of planets in Jupiter Masses:
- Earth = 0.00315
- Jupiter = 1
- Saturn = 0.3
- Uranus = 0.046
- Neptune = 0.054

Eccentricities of planets:
(0 is a perfect circle)
- Earth = 0.017
- Mercury = 0.21
- Mars = 0.093
- Pluto = 0.25

Earth’s orbital distance = 1 AU
Which of these planets would scientists suspect might hold life?

A. A planet very far from a cool red star.
B. A planet very close to a Sun-like star.
C. A planet near a hot blue star.
D. A planet near a star somewhat cooler than the Sun.
N = R^* \cdot f_{\phi} \cdot n_{e} \cdot f_{\phi} \cdot f_{\phi} \cdot f_{\phi} \cdot L
\[ N = R \times f_p \times n_e \times f_i \times f_e \times L \]
If the most pessimistic assumptions in the Drake equation were true, we would:

a. be able to find life in the Solar System.

b. have to wait for approximately 100 years to get a message back from the nearest intelligent life.

c. be the only intelligent life in the Milky Way.

d. be one of millions of intelligent civilizations in the Milky Way.

Even if there’s a very low chance that any one planet has life on it, there may be many advanced civilizations because …

A. There are billions and billions of stars in the universe.

B. Simple life inevitably leads to complex life.

C. We know that Earth-like planets are common in our galaxy.