

Name: _____ Date: _____

Stars and Solar System

Q1. Why is it difficult to observe the planet Mercury?

Ans. _____

Q2. The radius of Jupiter is 11 times the radius of the Earth. Calculate the ratio of the volumes of Jupiter and the Earth. How many Earths can Jupiter accommodate?

Ans. _____

Q3. Why is the distance between stars expressed in light years? What do you understand by the statement that a star is eight light years away from the Earth?

Ans. _____

Stars and Solar System

Q1. Why is it difficult to observe the planet Mercury?

Ans. The planet mercury is nearest to the Sun. It is the smallest planet of our solar system. Because Mercury is very close to the Sun, it is very difficult to observe it, as most of the time it is hidden in the glare of the Sun. However, it can be observed just before sunrise or just after sunset, near the horizon. So it is visible only at places where trees or buildings do not obstruct the view of the horizon.

Q2. The radius of Jupiter is 11 times the radius of the Earth. Calculate the ratio of the volumes of Jupiter and the Earth. How many Earths can Jupiter accommodate?

Ans. Earth's volume = $\frac{4}{3}\pi(r^3)$

Radius of Jupiter = $11r$

$$\therefore \text{Volume of Jupiter} = \frac{4}{3}\pi(11r)^3 = 1331\left(\frac{4}{3}\pi r^3\right)$$

$$\therefore \frac{\text{Volume of Jupiter}}{\text{Volume of Earth}} = \frac{1331\left(\frac{4}{3}\pi r^3\right)}{\frac{4}{3}\pi r^3} = 1331$$

Q3. Why is the distance between stars expressed in light years? What do you understand by the statement that a star is eight light years away from the Earth?

Ans. The Sun is nearly 150,000,000 kilometres (150 million km) away from the Earth. We cannot read this distance in kilometres conveniently. Some stars are even further away. Thus, such large distances are expressed in another unit known as light year. It means the distance between the star and the Earth is equal to the distance travelled by light in eight years.

1 light year = 9.46×10^{12} Km.

Therefore, the star is located $8 \times 9.46 \times 10^{12}$ Km = 75.68×10^{12} Km away from the Earth.