ANS

Name:_____

Chapter 1: Earth and Space
General Science 306

Astronomical Units and Light Years – Practice Questions

Astronomical Unit (AU)	Light Years (ly)
1 AU = 1.5 x 10^8 km	1 ly = 9.46 x 10^{12} km

Instructions

By using your knowledge gained from class and information found in your textbook, complete the following questions below.

1. At their closest point in orbit, the distance from the Earth to Jupiter is 630 million kilometers (630 000 000 km or 6.3 x 10^8 km). How far is the Earth from Jupiter in astronomical units (AU)?

Show your calculations below:

Step 1: Write what you know

$1\ AU = 1.5 \times 10^8\ km$

Step 2: Write what was given

$\frac{X}{1\ AU} = \frac{6.3 \times 10^8\ km}{1.5 \times 10^8\ km}$

Step 3: Cross multiply.

$X = \frac{6.3 \times 10^8\ km \times 1\ AU}{1.5 \times 10^8\ km}$

$X = 4.2\ AU$

2. At the opposite ends of their orbit, the distance that separates Earth and Mars is about 401 million kilometers (401 000 000 km, or 4.01 x 10^8 km). How far is the Earth from Mars at their farthest distance apart in astronomical units (AU)?

Show your calculations below:

a. $\frac{X}{1\ AU} = \frac{4.01 \times 10^8\ km}{1.5 \times 10^8\ km}$

b. $X = \frac{4.01 \times 10^8\ km \times 1\ AU}{1.5 \times 10^8\ km}$

c. $X = 2.67\ AU$

3. The average distance between Earth and Neptune is 29.3 AU. How far is Earth from Neptune in kilometers?

Show your calculations:

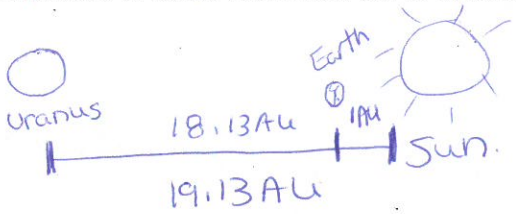
a. $\frac{29.3\ AU}{1\ AU} = \frac{X}{1.5 \times 10^8\ km}$

b. $X = \frac{1.5 \times 10^8\ km \times 29.3\ AU}{1\ AU}$

c. $X = 4.4 \times 10^9\ km$

4. The average distance between Uranus and the Sun is 19.13 AU. How far is Uranus from the Earth in km? This is a two-step question.

Show your calculations below:



Uranus − Earth
19.13AU − 1AU = 18.13AU
↑ distance from Earth to Uranus.

(a.) $\frac{18.13\,AU}{1\,AU} = \frac{X}{1.5\times10^{8}\,km}$

(b.) $X = \frac{18.13\,AU \times 1.5\times10^{8}\,km}{1\,AU}$

(c.) $X = 2.7\times10^{9}\,km$

5. If the star 'Sirius' is 8.52 light years away from our Sun. How far away is it in kilometers?
Show your calculations below:

(a.) $\frac{8.52\,LY}{1\,LY} = \frac{X}{9.46\times10^{12}\,km}$

(b.) $X = \frac{8.52\,LY \times 9.46\times10^{12}\,km}{1\,LY}$

(c.) $X = 8.06\times10^{13}$ [illegible] km

6. If the star 'Wolf 359' is 7.35988×10^{13} km away from our Sun, how far away is it in light years?

Show your calculations:

(a.) $\frac{X}{1\,LY} = \frac{7.35988\times10^{13}\,km}{9.46\times10^{12}\,km}$

(b.) $X = \frac{7.35988\times10^{13}\,km \times 1\,LY}{9.46\times10^{12}\,km}$

(c.) $X = 7.78\,LY$

7. If the star 'Lalande 21185' is 8.29 light years away from our Sun, how far away is it in km?

(a.) $\frac{8.29\,LY}{1\,LY} = \frac{X}{9.46\times10^{12}\,km}$

(b.) $X = \frac{8.29\,LY \times 9.46\times10^{12}\,km}{1\,LY}$

(c.) $X = 7.84\times10^{13}\,km$