

Name _____ Date _____ Period _____

Astronomy Scale Problems - Free Response HW

A student constructed a scale model of the size of the planets. In the model the equatorial diameter of the Earth was 1 cm. Using this scale, determine the proper size of the planets Jupiter and Pluto. Be sure to show all mathematical work and round your answer to the nearest 100th of a centimeter. (ESRT p 15)

Scale size of Jupiter = _____ cm

(Show work below) Equitorial Diameter = _____ km

Scale size of Pluto = _____ cm

(Show work below) Equitorial Diameter = 2,300 km

Size of Venus = _____ cm

(Show work below) Equitorial Diameter = _____ km

One unit of Astronomic Distance is the Astronomic Unit (AU). An AU is the mean distance between the sun and the Earth. Any planet that is closer to the sun would have an orbit with an average distance less than 1 AU. Outer planets would have distances greater than one AU. The ESRT has Solar System data on page 15 which includes Mean distance from the sun. This data can be used to calculate the orbital distances in Astronomic Units (AU).

Complete the chart below based on the data on the ESRT. To calculate the orbital distance in AU you have to divide the Mean distance by the Earth's mean distance from the sun. Round your answers to the nearest hundredth.

Example - Jupiter - mean distance = 778.4 million km

$$\text{Mean distance in AU} = \frac{778.4 \text{ million km}}{149.6 \text{ million km}} = 5.20 \text{ AU}$$

In other words, Jupiter is 5.20 times farther from the sun than the Earth.

Calculate the scale distance if a scale model of the Solar system was created from the data with the distance of 1 AU = 10 cm. Round your answer to the nearest tenth of a cm (0.1)

Planet	Mean Distance from the Sun (million km)	Mean Distance from Sun (AU)	Scale Distance (cm)
Mercury			
Venus			
Earth			
Mars			
Jupiter			
Saturn			
Uranus			
Neptune			
Pluto	5,900		