

Chapter 22 Origin of Modern Astronomy

Section 22.1 Early Astronomy

This section outlines the early history of astronomy, especially changing ideas about Earth's place in the universe.

Reading Strategy

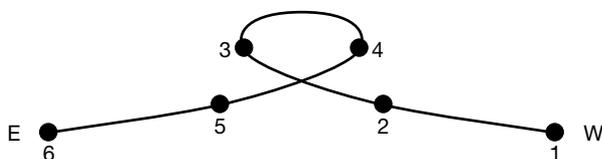
As you read about the geocentric and heliocentric models of the solar system, complete the table. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.

	Location of Earth	Location of Sun	Supporters of Model
Geocentric Model	center of universe	a.	b.
Heliocentric Model	c.	d.	e.

Ancient Greeks

- The study of the properties of objects in space and the laws under which the universe operates is called _____.
- Is the following sentence true or false? Eratosthenes is considered to be the first person to calculate the size of Earth. _____
- ☛ The idea that the moon, sun, and known planets orbit Earth is called the _____ model of the universe.
- ☛ Describe the heliocentric model of the universe. _____

- Circle the letter of the statement that is true.
 - The geocentric theory is correct.
 - The geocentric theory is flawed and was immediately rejected.
 - The geocentric theory is flawed but was accepted for thousands of years.
 - The geocentric theory is accepted today.
- The figure shows the apparent motion of Mars as seen from Earth. What type of motion is occurring between points 3 and 4?



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7. Is the following sentence true or false? Ptolemy's geocentric model was unable to account for the observed retrograde motion of the planets. _____

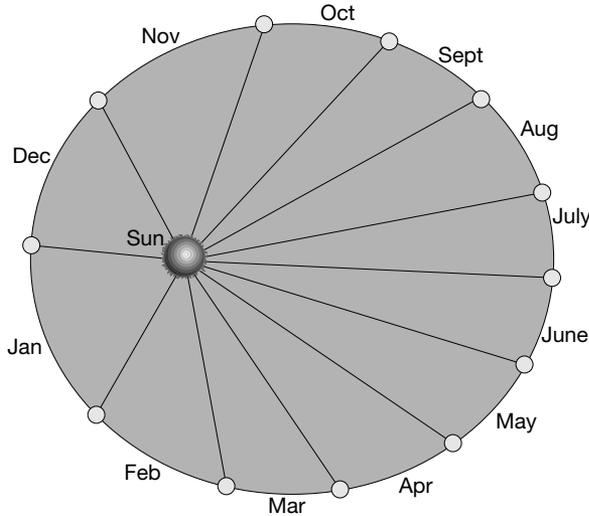
The Birth of Modern Astronomy

Match each description with its astronomer.

- | Description | Astronomer |
|--|------------------------|
| _____ 8. ☿ developed a model of the solar system with the sun at the center | a. Johannes Kepler |
| _____ 9. ♀ formulated and tested the law of universal gravitation | b. Isaac Newton |
| _____ 10. ♀ discovered three laws of planetary motion | c. Galileo Galilei |
| _____ 11. ♀ made much more precise observations than previous astronomers made | d. Nicolaus Copernicus |
| _____ 12. ♀ described the behavior of moving objects | e. Tycho Brahe |

13. Circle the letter of the word that describes the shape of the planet's orbit as shown in the figure.

- a. circle b. retrograde c. ellipse d. focus



14. Is the following sentence true or false? During December and January on the figure, the planet is moving the fastest.

15. If the planet in the figure is Earth, the average distance from the planet to the sun is about 150 million km, or one _____.
16. List the two factors that Newton showed combined to keep the planets in their elliptical orbits. _____