

Closed book, closed notes. Clearly circle ("O") the one choice that you think is most definitely correct. Cross out ("X") only one choice that you think is definitely incorrect.

For questions (1)-(2), on April 8, 2024, observers in San Luis Obispo, CA will observe a partial solar eclipse.¹

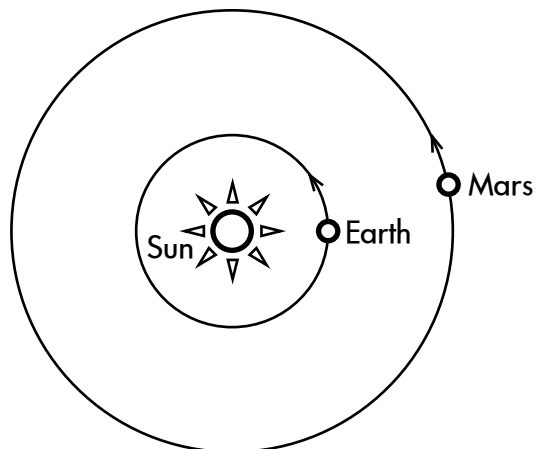
1. [4.0 points.] During this partial solar eclipse, observers in San Luis Obispo, CA will be located in:
 - (A) the moon's umbra.
 - (B) the moon's penumbra.
 - (C) the moon's negative shadow.
 - (D) Earth's umbra.
 - (E) Earth's penumbra.

2. [4.0 points.] During this partial solar eclipse, the moon will be in its _____ phase.
 - (A) new.
 - (B) first quarter.
 - (C) full.
 - (D) third quarter.
 - (E) (Depends on the time of day.)

-
3. [4.0 points.] Aristotle based his model of the universe on *first principles*, which:
 - (A) are ideas accepted as truth without further examination.
 - (B) are predictions that could be tested by observations.
 - (C) are universal statements of cause and effect.
 - (D) describe phenomena without explaining why it occurs.

 4. [4.0 points.] _____ explained the prograde and retrograde motion of a planet by having it move on a circle that itself moves around Earth.
 - (A) Aristotle.
 - (B) Ptolemy.
 - (C) Copernicus.
 - (D) Tycho.
 - (E) Kepler.
 - (F) Galileo.
 - (G) Newton.

-
5. [4.0 points.] The diagram at right shows Mars _____ retrograde motion, as seen from Earth.
 - (A) about to start.
 - (B) in the middle of.
 - (C) just completing.



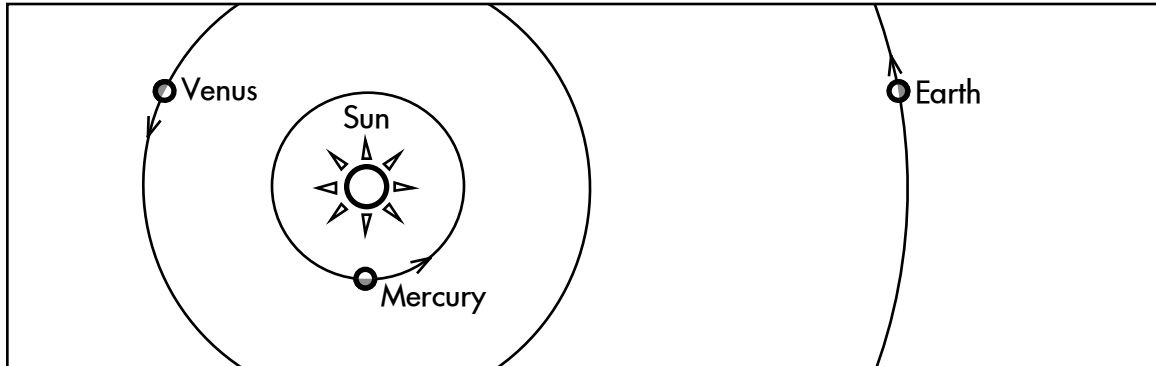
Questions (6)-(10) are continued on the back of this page.

¹ timeanddate.com/eclipse/in/usa/san-luis-obispo?iso=20240408.
20.02.13

Closed book, closed notes. Clearly circle ("O") the one choice that you think is most definitely correct. Cross out ("X") only one choice that you think is definitely incorrect.

This quiz continues from questions (1)-(5) on the other side of this page.

For questions (6)-(7) the locations of Mercury, Venus, and Earth are shown in the diagram below (not to scale, and orbits have been simplified as circles instead of ellipses).



6. [4.0 points.] At sunset, _____ will be visible somewhere in the sky.
- (A) Mercury.
 - (B) Venus.
 - (C) (Both of the above choices.)
 - (D) (Neither of the above choices.)
7. [4.0 points.] At sunrise, Venus will be:
- (A) low over the east horizon.
 - (B) somewhere high up in the sky.
 - (C) low over the west horizon.
 - (D) not visible in the sky.
-
8. [4.0 points.] Kepler's laws are *empirical*, because they:
- (A) are universal statements of cause and effect.
 - (B) are accepted as truth without further examination.
 - (C) make predictions that could be tested by observations.
 - (D) describe phenomena without explaining why it occurs.
9. [4.0 points.] Galileo's observations of the moons of Jupiter supported the heliocentric model of planetary motion over the geocentric model because:
- (A) their orbits were elliptical instead of circular.
 - (B) there could be centers of motion other than Earth.
 - (C) no parallax was observed.
 - (D) it showed that epicycles and deferents were not real.
10. [4.0 points.] Newton's laws remade astronomy into an analytical science because these laws make predictions that:
- (A) could be tested by observation.
 - (B) the universe is perfect and unchanging.
 - (C) describe motion without explaining why it occurs.
 - (D) deduced truth about the universe from first principles.