

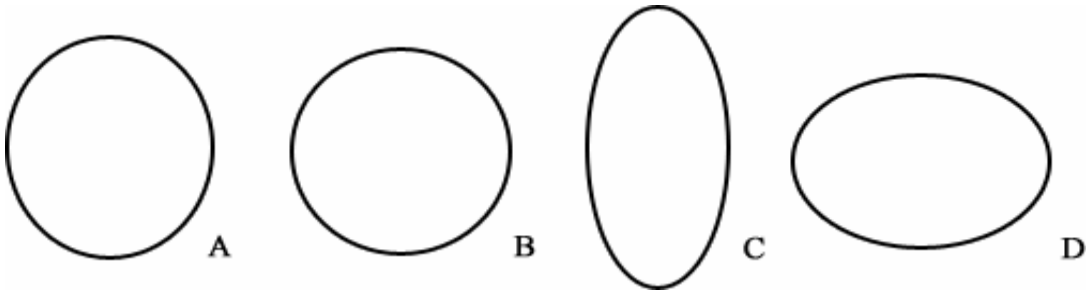
Planetary Orbit Simulator – Pretest

Answer the following questions.

Question 1: Which of the following is not part of Kepler's contribution to planetary orbits?

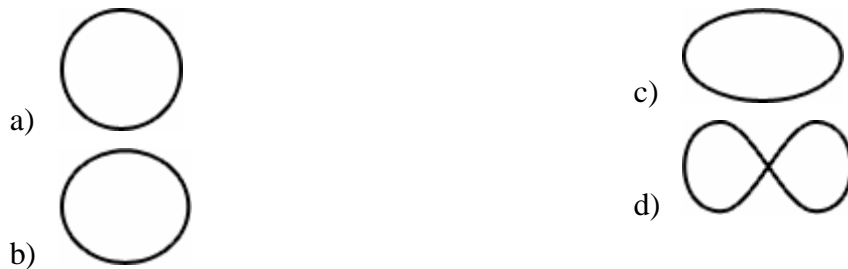
- a) shapes of the orbit
- b) speeds of planets in their orbit
- c) orbital period
- d) gravity

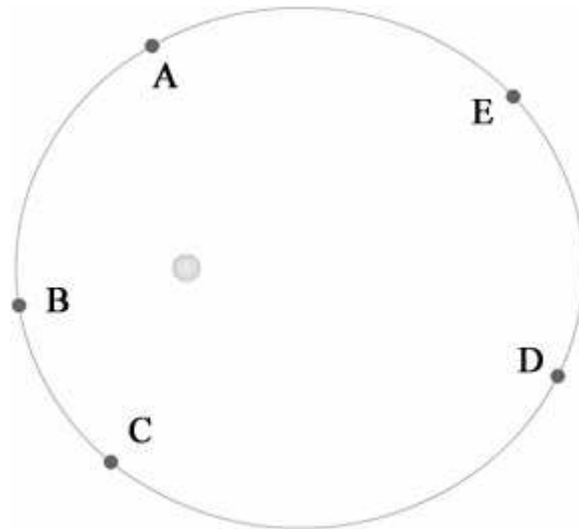
Question 2: Rank the following 4 ellipses below in order of increasing ellipticity.



- a) A, B, C, D
- b) B, A, D, C
- c) C, D, B, A
- d) D, C, B, A

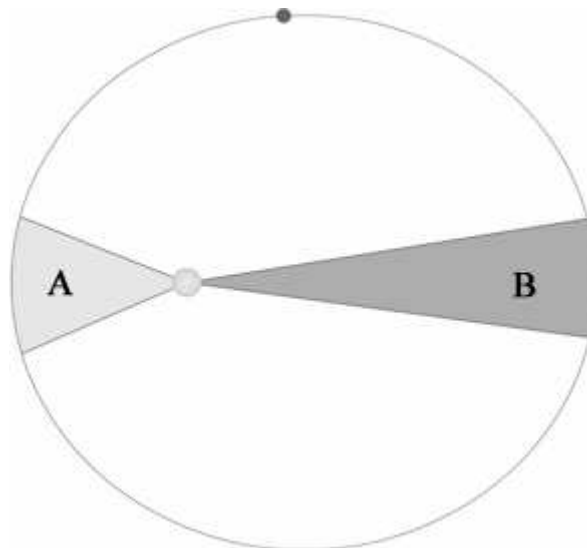
Question 3: Which of the following look most like the orbit of Venus?





Question 4: At which point or points is the planet slowing down? (planets shown here are assumed to be orbiting counter-clockwise)

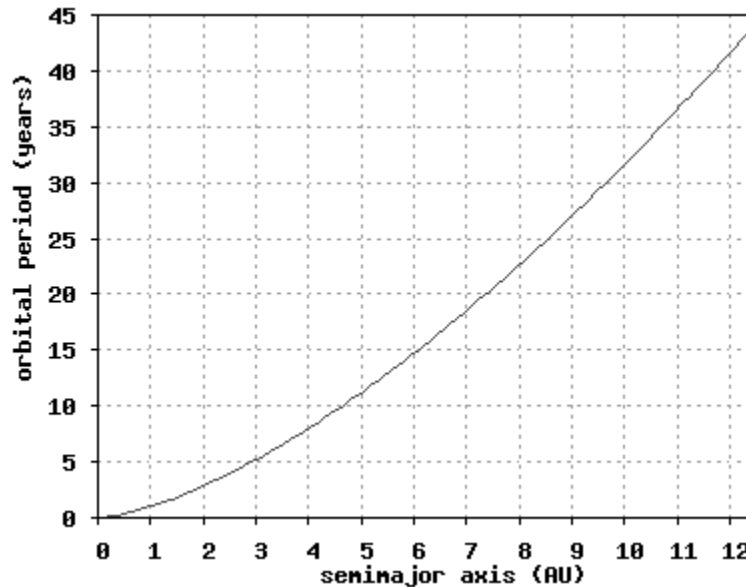
- a) A, E
- b) B,C,D
- c) D
- d) A, B, C, D, E
- e) none of the points (the planet is moving at constant speed)



Question 5: With respect to the figure above, which of the following statements is true?

- a) The planet will cover regions A and B in the same amount of time because of Kepler's 2nd Law.

- b) The planet will cover region A in a faster amount of time than region B, because A has less area.
- c) The planet will take longer to move through region A because it is moving slower in region A than it is in region B.



Question 6: Using the graph, a planet with a semimajor axis of 10 will have an orbital period of about

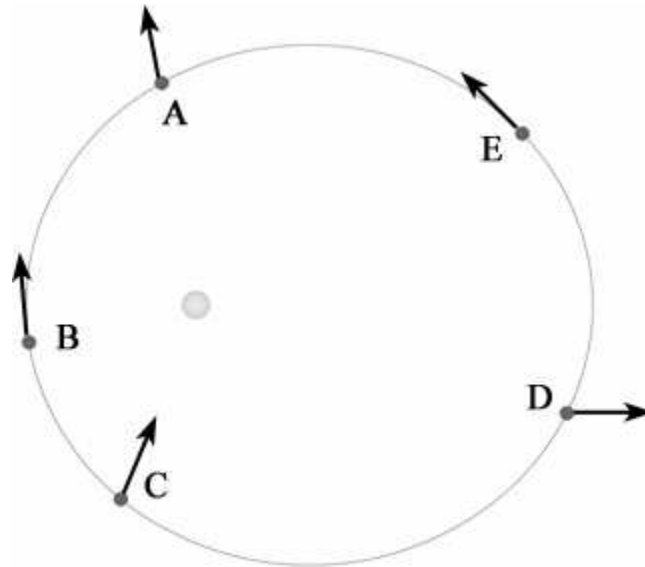
- a) 4.6 years
- b) 10 years
- c) 32 years
- d) 100 years

Question 7: The orbital period of Mars is

- a) longer than earth's orbital period because it is farther from the sun.
- b) shorter than earth's orbital period because it is farther from the sun.
- c) longer than the earth's orbital period because its orbit is less circular.
- d) short than the earth's orbital period because its orbit is more circular.

Question 8: The acceleration of a planet is

- a) directly opposite the planet's motion if it is slowing down.
- b) in the same direction of the planet's motion if it is speeding up.
- c) always towards the sun.
- d) always away from the sun.



Question 9: If the arrows depicted in the picture represent velocity, which planet or planets is shown correctly? (Planets can be orbiting either clockwise or counterclockwise.)

- a) A
- b) C
- c) D
- d) B, E

Question 10: If a planet has a semimajor axis of 4 and an eccentricity of 0.2, how far is the planet at aphelion?

- a) 0.8
- b) 3.2
- c) 3.8
- d) 4.2
- e) 4.8
- f) 20