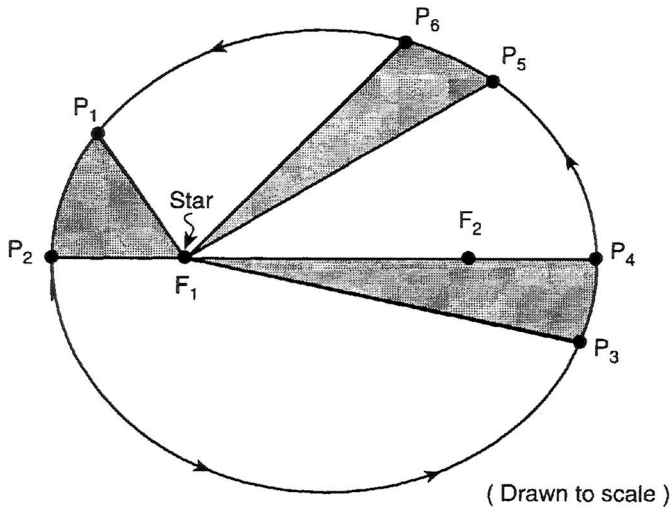


# Misc. Questions

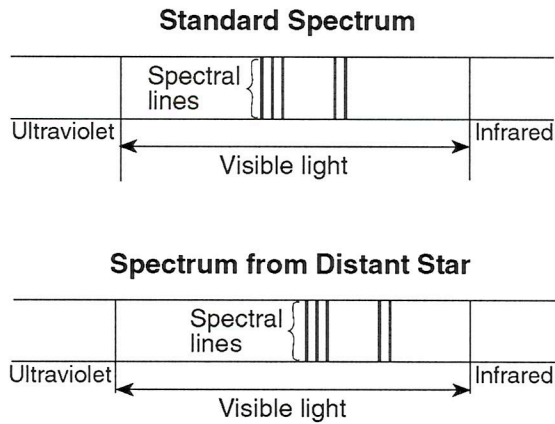
Base your answers to questions 1 through 5 on the diagram below which represents a planet,  $P$ , in an elliptical orbit around a star located at  $F_1$ . The foci of the elliptical orbit are  $F_1$  and  $F_2$ . Orbital locations are represented by  $P_1$  through  $P_6$ .



- If the mass of planet  $P$  were tripled, the gravitational force between the star and planet  $P$  would
  - remain the same
  - be two times greater
  - be three times greater
  - be nine times greater
- The gravitational attraction between planet  $P$  and the star is greatest when the planet is located at position
  - $P_1$
  - $P_2$
  - $P_3$
  - $P_4$
- When observed from the planet, the star would have its greatest apparent angular diameter when the planet is located at position
  - $P_1$
  - $P_2$
  - $P_3$
  - $P_4$
- What is the approximate eccentricity of planet  $P$ 's orbit?
  - 0.52
  - 0.83
  - 2.11
  - 4.47

- If the shaded portions of the orbital plane are equal in area, the time period between  $P_1$  and  $P_2$  will be equal to the time period between
  - $P_2$  and  $P_3$
  - $P_4$  and  $P_5$
  - $P_3$  and  $P_4$
  - $P_6$  and  $P_1$
- Why are impact structures (craters) more common on the surface of Mars than on the surfaces of Venus, Earth, and Jupiter?
  - Mars has the greatest surface area and receives more impacts.
  - The tiny moons of Mars are breaking into pieces and showering its surface with rock fragments.
  - Mars has a strong magnetic field that attracts iron-containing rock fragments from space.
  - The thin atmosphere of Mars offers little protection against falling rock fragments from space.
- The giant planets are composed primarily of
  - hydrogen and helium
  - carbon dioxide
  - iron
  - rocky materials
- Which statement best describes galaxies?
  - They are similar in size to the solar system.
  - They contain only one star but hundreds of planets.
  - They may contain a few hundred stars in a space slightly larger than the solar system.
  - They may contain billions of stars in a space much larger than our solar system.
- According to the big bang theory, the universe began as an explosion and is still expanding. This theory is supported by observations that the stellar spectra of distant galaxies show a
  - concentration in the yellow portion of the spectrum
  - concentration in the green portion of the spectrum
  - shift toward the blue end of the spectrum
  - shift toward the red end of the spectrum

10. The diagram below shows a standard spectrum compared to a spectrum produced from a distant star.



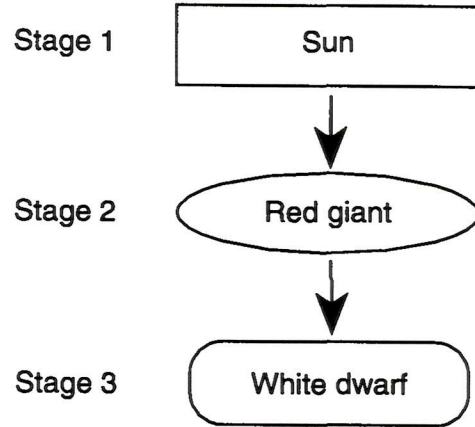
Which conclusion can be made by comparing the standard spectrum to the spectrum produced from this distant star?

- 1) The star's spectral lines have shifted toward the ultraviolet end of the spectrum and the star is moving toward Earth.
- 2) The star's spectral lines have shifted toward the ultraviolet end of the spectrum and the star is moving away from Earth.
- 3) The star's spectral lines have shifted toward the infrared end of the spectrum and the star is moving toward Earth.
- 4) The star's spectral lines have shifted toward the infrared end of the spectrum and the star is moving away from Earth.

11. Most of the radiant energy released by the sun results from the process of

- 1) nuclear fission
- 2) nuclear fusion
- 3) combustion
- 4) electrical generation

12. Stars are believed to undergo evolutionary changes over millions of years. The flowchart below shows stages of predicted changes in the Sun.



According to this flowchart, the Sun will become

- 1) hotter and brighter in stage 2, then cooler and dimmer in stage 3
- 2) cooler and dimmer in stage 2, then hotter and brighter in stage 3
- 3) hotter and dimmer in stage 2, then cooler and brighter in stage 3
- 4) cooler and brighter in stage 2, then hotter and dimmer in stage 3

Answer Key  
[New Exam]

1. 3

2. 2

3. 2

4. 1

5. ~~2~~ 3

6. 4

7. 1

8. 4

9. 4

10. 4

11. 2

12. 4

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