

OpenStax Astronomy, Ch.12: WS Problems (Apr-2021)

Review Questions

1. What is the evidence for a liquid water ocean on Europa, and why is this interesting to scientists searching for extraterrestrial life?
2. Explain the energy source that powers the volcanoes of Io.
3. Compare the properties of Titan's atmosphere with those of Earth's atmosphere.
4. How was Pluto discovered? Why did it take so long to find it?
5. How are Triton and Pluto similar?
6. Describe and compare the rings of Saturn and Uranus, including their possible origins.
7. List at least three major differences between Pluto and the terrestrial planets.
8. The Hubble Space Telescope images of Pluto in 2002 showed a bright spot and some darker areas around it. Now that we have the close-up New Horizons images, what did the large bright region on Pluto turn out to be?
9. Why do you think the outer planets have such extensive systems of rings and moons, while the inner planets do not?
10. Would you expect to find more impact craters on Io or Callisto? Why?
11. Why do you suppose the rings of Saturn are made of bright particles, whereas the particles in the rings of Uranus and Neptune are black?
12. Suppose you miraculously removed all of Saturn's moons. What would happen to its rings?
13. Saturn's A, B, and C Rings extend 75,000 to 137,000 km from the center of the planet. Use Kepler's third law to calculate the difference between how long a particle at the inner edge and a particle at the outer edge of the three-ring system would take to revolve about the planet.
14. The average distance of Enceladus from Saturn is 238,000 km; the average distance of Titan from Saturn is 1,222,000 km. How much longer does it take Titan to orbit Saturn compared to Enceladus?