

---

## OpenStax Astronomy, Ch.10: WS Problems (Apr-2021)

### Review Questions

1. List several ways that Venus, Earth, and Mars are similar, and several ways they are different.
2. Compare the current atmospheres of Earth, Venus, and Mars in terms of composition, thickness (and pressure at the surface), and the greenhouse effect.
3. How might Venus' atmosphere have evolved to its present state through a runaway greenhouse effect?
4. Describe the current atmosphere on Mars. What evidence suggests that it must have been different in the past?
5. Explain the runaway refrigerator effect and the role it may have played in the evolution of Mars.
6. What evidence do we have that there was running (liquid) water on Mars in the past? What evidence is there for water coming out of the ground even today?
7. What evidence is there that Venus was volcanically active about 300–600 million years ago?
8. Why is Mars red?
9. What is the composition of clouds on Mars?
10. What is the composition of the polar caps on Mars?
11. Describe two anomalous features of the rotation of Venus and what might account for them.
12. How was the *Mars Odyssey* spacecraft able to detect water on Mars without landing on it?
13. Venus and Earth are nearly the same size and distance from the Sun. What are the main differences in the geology of the two planets? What might be some of the reasons for these differences?
14. Why is there so much more carbon dioxide in the atmosphere of Venus than in that of Earth? Why so much more carbon dioxide than on Mars?
15. Is it likely that life ever existed on either Venus or Mars? Justify your answer in each case.
16. We believe that Venus, Earth, and Mars all started with a significant supply of water. Explain where that water is now for each planet.
17. One source of information about Mars has been the analysis of meteorites from Mars. Since no samples from Mars have ever been returned to Earth from any of the missions we sent there, how do we know these meteorites are from Mars? What information have they revealed about Mars?
18. Near the martian equator, temperatures at the same spot can vary from an average of  $-135\text{ }^{\circ}\text{C}$  at night to an average of  $30\text{ }^{\circ}\text{C}$  during the day. How can you explain such a wide difference in temperature compared to that on Earth?
19. At its nearest, Venus comes within about 41 million km of Earth. How distant is it at its farthest?



