

HW Packet: Basic Astronomy and History of Astronomy

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1. Define the universe:
2. Define astronomy:
3. What is a light-year?
4. What are the defining characteristics of a modern theory?
 - a. _____
 - b. _____
 - c. _____
 - d. _____
5. What is Occam's Razor?
6. Science Check: Can a theory ever become a "fact" scientifically speaking?
(check answer)

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7. How many stars can be seen on a clear night with the unaided eye?
8. What is a constellation? How many are there?
9. What is an astrologer?
10. What is the celestial sphere?
11. What is an angular measure? (discuss the 3 scales) And how big is the sun, moon, and little finger at arms length?

12. What is the difference between a solar day and a sidereal day?

13. Use figure 1.15 to answer: What 2 zodiac constellations are visible in...

a. March: _____ and _____

b. September: _____ and _____

c. Why do the zodiac constellations change through the seasons?

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14. What is the ecliptic?

15. What is the zodiac?

16. What is the summer/winter solstice and when do they usually occur?

17. Discuss at least two reasons why the seasons occur (why would it be summer in the northern hemisphere and winter in the southern hemisphere at the same time)?

18. What are the two equinoxes and when do they occur?

19. How long is one tropical year? _____ mean solar days

20. What is precession and what causes? How long does it take for one cycle?

21. How long is a sidereal year? _____ mean solar days

22. Which year does our calendar use? Sidereal or Tropical
23. Concept Check: In astronomical terms, what are summer and winter, and why do we see different constellations during those seasons? (check answer)
24. How long does it take the moon to go through its phases/
a. Sidereal month_____
- b. Synodic month_____
25. If the full moon disc is always present in the night sky why do we always see a full moon?
26. Draw the set up for a full lunar eclipse (label sun, moon, and earth and draw the shadow)
27. Draw the set up for a full solar eclipse (label sun, moon, earth, umbra and penumbra).
28. What is the difference between a partial, total and annular eclipse? Draw a picture if necessary.
29. Why isn't there a solar eclipse at every new Moon and a lunar eclipse at every full Moon?
30. When will the next solar eclipse occur in North America? Will it be visible from Oregon? (Use figure 1.27)

31. How is triangulation used to determine distance of an object?
32. How is parallax used to determine the distance of an object in space? Draw a picture if necessary and label appropriate measurements.
33. Would an object close to Earth have a LOT or LITTLE parallax compared to an object far away.
34. Concept check: Why is elementary geometry essential for measuring distance in astronomy? (check answer)

Chpt 2: The Copernican Revolution

35. Where did the name planet come from and what does it mean?
36. What is prograde and retrograde motion?
37. What is the geocentric model and who came up with it?
38. Draw the simple geocentric model in figure 2.6 and label all parts including the deferent and epicycle.

39. How many circles did the Ptolemaic model require?
40. How long did the geocentric model stay unchallenged?
41. What is the heliocentric model and what did it explain?
42. Draw a picture of showing how the planet Mars would have retrograde motion when viewed from Earth (refer to figure 2.9).
43. What discoveries did Galileo see through his telescope that supported the ideas of Copernicus?
44. What happened to Galileo after he published his books?

45. What did Tycho Brahe contribute to astronomy?
46. What is Kepler's 1st law?
47. What is eccentricity?
48. What is Kepler's 2nd law?
49. What is Kepler's 3rd Law? Define period and semimajor axis.
50. Kepler's 3rd law can be rewritten as....
51. Which planet do we use radar to verify distance? _____
52. What are Newton's 3 laws? List all 3.
53. If an object is moved 3x the distance from the sun, the force felt by the sun would be _____ the original force, and if the object was 5x the distance it would be ____ the original force.

54. What two forces are in place to keep a planet in orbit? (figure 2.23)

55. What is escape speed?

56. What is the speed needed for a satellite to stay in orbit around Earth and to leave Earth?

a. Orbit_____

b. Escape_____

57. Look through Chpts 3 & 4 for further understanding of Radiation, Electromagnetic Spectrum and Spectroscopy.