

Astronomy 301

Introduction to Astronomy

HOMEWORK 1

- **Due Thursday, September 10, 2015**
- **Answer all questions in Part A and 1 of the 3 questions in Part B.**
- **Electronic copies of answers will not be graded.**

PART A

- A1. The average distance of Venus from the Sun is ____ AU.
- A2. What is the maximum distance between Earth and Venus? Give answer in AU.
- A3. If the nearest star is 4.2 light years away then
- a. the light we see left the star 4.2 years ago.
 - b. the star is 4.2 million AU away.
 - c. the star must have formed 4.2 billion years ago.
 - d. all of these.
- A4. Which of the following stars is most likely to be the brightest?
- a. α Tauri
 - b. γ Tauri
 - c. ζ Scuti
 - d. ρ Puppis
- A5. How many degrees does the celestial sphere appear to rotate in one hour?
- A6. How many degrees does the earth rotate on its axis in one hour?
- A7. If the angular size of the Sun is 0.5 degrees as seen from Earth, what is the Sun's angular size as seen from Mercury? Mercury is about 0.4 AU from the Sun.
- A8. What is the Local Group?
- A9. How long does it take light to travel across the diameter of our Galaxy?

A10. What is 10^4 ?

- a. a thousand
- b. ten thousand
- c. a hundred thousand
- d. a million
- e. ten million

A11. If you were on the equator, where would you have to look to see the North Pole Star?

- a) straight overhead
- b) the Northern horizon
- c) the Eastern horizon
- d) about 45° above the northern horizon

A12. Select the correct answer.

If you lived on the Moon, at a location from which you could see the Earth, the Earth

- a) would seem to go through phases.
- b) would always appear full.
- c) would appear in about a quarter phase.
- d) would seem to rise and set periodically.
- e) both (a) and (d) above.

(N.B. The Moon orbits the Earth keeping the same face towards the Earth)

A13. What phase must Venus be at when it is closest to the Earth?

- a) Full
- b) New
- c) Last quarter
- d) First quarter

A14. How many times would a flash of light travel around the Earth in a second?

A15. The Sun (and Earth) orbits around

- a) The center of the galaxy
- b) The Earth
- c) The Orion Nebula
- d) Polaris

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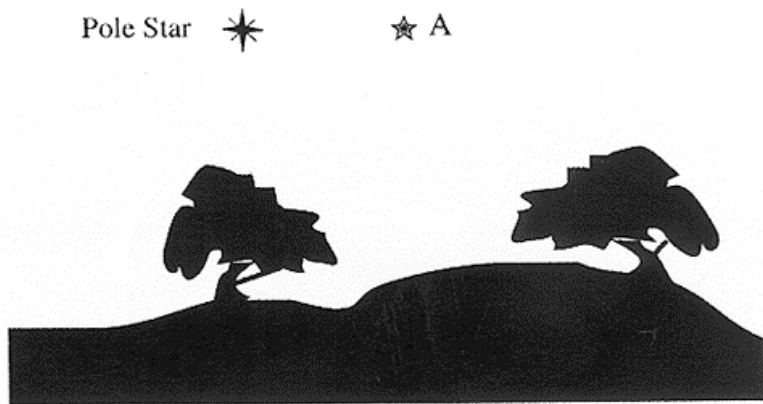
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PART B

In answering the questions, imagine you are an author of a book for junior high students. Do not simply copy or paraphrase Seeds' glossary. Be imaginative!

B1.

- a) The sketch below shows the Pole Star and one other star (A), as observed from your backyard.



Show with sketches how the stars will appear in the sky in 3 hours time, and in 6 hours time.

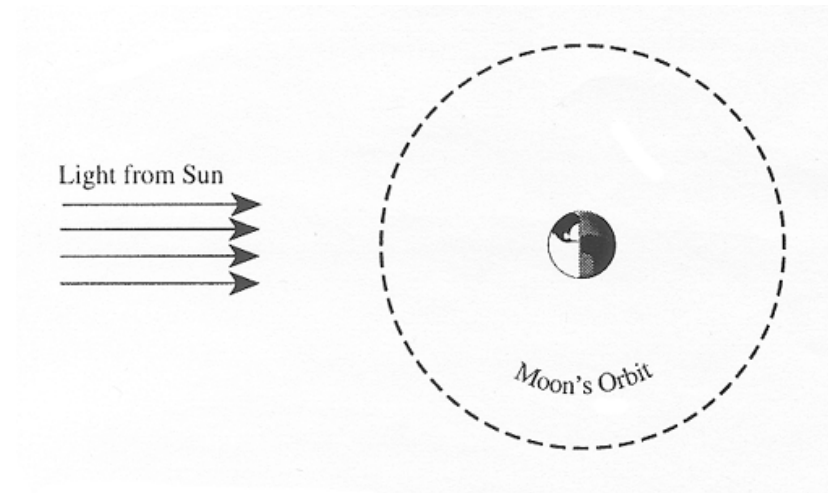
- b) Tonight, Orion is a striking constellation in the south-east near dawn. Explain why Orion is *not* seen in our summer evening sky.
c) Tonight, the Big Dipper is easily seen towards the north. Explain why the Big Dipper is easily seen on every night.

B2.

- a) What is 'the celestial sphere'?
b) What is 'the celestial equator'?
c) What is 'the ecliptic'?
d) Explain fully why the ecliptic is not coincident with the celestial equator.

B3.

- a) Explain why Venus as a 'crescent' appears larger in size than when it is 'full'. How many times larger is it as a crescent than when full?
b) Why does Jupiter never appear as a half-moon to an observer on Earth?
c) Mark the phase on the Moon's orbit at all positions at which the Moon appears at quarter phase.



CHECKLIST

- Have you answered all questions in Part A and 1 from Part B?
- For questions A2, A5, A6, A7, and A14 I suggest you outline how you arrived at the answer.
- For the questions in Part B, I expect at least a few complete sentences. Please use your own words. Clear labeled diagrams are often helpful, even if not explicitly requested.

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"In an examination those who do not wish to know ask questions of those who cannot tell."

Sir Walter Alexander Raleigh (1861-1922)

Some thoughts on Examinations

"Examinations are formidable even to the best prepared, for the greatest fool may ask more than the wisest man can answer."

Charles Caleb Colton (1780?-1832)
