

**Introductory Astronomy****NAME:**

**Homework 12: The Moon and Mercury:** Homeworks and solutions are posted on the course web site. Homeworks are **NOT** handed in and **NOT** marked. But many homework problems (~ 50–70%) will turn up on tests.

**Answer Table**

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001 qmult 00007 1 4 1 easy deducto-memory: reading-homework-self-testing done 2

1. Did you complete reading-homework-self-testing for the Introductory Astronomy Lecture (IAL) by the weekly due date?

a) YYYesssss!    b) Jawohl!    c) Da!    d) Sí, sí.    e) OMG no!

**SUGGESTED ANSWER:** (a),(b),(c),(d)

**Wrong answers:**

- e) As Lurch would say AAAARGH.

**Redaction:** Jeffery, 2008jan01

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012 qmult 00100 1 1 1 moderate memory: lunar tidal locking

2. The lunar month is:

- a) the same length as the lunar day due to tidal locking (i.e., tidal coupling or tidal force effects).  
 b) the same length as the lunar day due to radioactivity.  
 c) the same length as the lunar day due to the solar wind (i.e., solar wind interactions with the Moon's magnetic field).  
 d) the same length as the lunar day due to light reflected from Earth.  
 e) twice the length of the lunar day.

**SUGGESTED ANSWER:** (a) I may not have used the term tidal coupling in the lectures, but people should be able to rule out the wrong answers.

**Wrong answers:**

- e) No!

**Redaction:** Jeffery, 2001jan01

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012 qmult 00120 2 5 2 moderate thinking: Moon's daytime

3. The mean lunar month (i.e., the period from new moon to new moon) is 29.53059 days. The Moon is synchronously tidally locked to the Earth. How long is the **DAYLIGHT PERIOD** of the Moon's day at any point on the Moon? **HINT:** A diagram might help.

a) 29.53059 days.    b) about 14.8 days.    c) about 29 days.    d) 12 hours.  
 e) about 365.25 days.

**SUGGESTED ANSWER:** (b)

**Wrong answers:**

- d) This is Earth's average daytime period.  
 e) 365.25 is exactly a Julian year.

**Redaction:** Jeffery, 2001jan01

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012 qmult 00130 2 5 5 moderate thinking: Earth seen from Moon

4. You are standing on the near side of the Moon. How does the Earth's position in the sky change relative to your local horizon?

- a) The Earth moves across sky from eastern to western horizon for a 12 hour period on average and then is below the horizon for another 12 hour period on average. The Earth does show phases that depend on the time of the lunar month.  
 b) The Earth circles the zenith position every 24 hours.  
 c) The Earth circles the zenith position every 29.53059 days on average.  
 d) The Earth zigzags randomly all across the sky.  
 e) The Earth stays more or less fixed in the sky relative to the local horizon because of the synchronous tidal locking of the Moon to the Earth. The Earth jiggles about a little because of some wobbling of the Moon. The Earth does show phases that depend on the time of the lunar month.

**SUGGESTED ANSWER:** (e) See HI-136.

**Wrong answers:**

- d) On the near side of the Moon, the Earth must always be above the horizon.

**Redaction:** Jeffery, 2001jan01

012 qmult 00210 2 4 2 moderate deducto-memory: two-Moon-Earth facts

5. Two immediately striking facts about the Moon in comparison to the Earth are (1) the Moon's radius is about \_\_\_\_\_ times the Earth's radius and (2) the Moon's mean density is about \_\_\_\_\_ times the Earth mean density.

a) 1/4; 2      b) 1/4; 3/5      c) 1/2; 2      d) 2; 2      e) 1/10; 1/20

**SUGGESTED ANSWER:** (b)

**Wrong answers:**

- e) Both values are way too small.

**Redaction:** Jeffery, 2001jan01

012 qmult 00220 2 1 3 moderate memory: mean lunar density 1

6. The mean lunar density relative to the mean Earth density is:

a) high.      b) negligible.      c) low.      d) identical.      e) practically the same.

**SUGGESTED ANSWER:** (c)

**Wrong answers:**

- a) Exactly wrong.

**Redaction:** Jeffery, 2001jan01

012 qmult 00225 2 5 3 moderate thinking: Moon's gravity

7. The Moon's mass is about 1/80 of the Earth's mass. But the Moon's surface gravity is about 1/6 of the Earth's surface gravity. Why isn't the Moon's surface gravity about 1/80 of the Earth's surface gravity?

- a) The gravitational force of the Earth increases the downward gravitational force on the Moon.  
 b) The gravitational force law has mass **TIMES** radius squared. The Moon has a small mass relative to Earth, but also a small radius relative to Earth. The two differences cancel somewhat, and so the Moon's surface gravity is not as small as just considering the Moon mass only suggests.  
 c) The gravitational force law has mass **DIVIDED** by radius squared. The Moon has a small mass relative to Earth, but also a small radius relative to Earth. The two differences cancel somewhat, and so the Moon's surface gravity is not as small as just considering the Moon mass only suggests.  
 d) Magnetic fields on the Moon increase the effect of gravity.  
 e) The astronauts were too full of turkey.

**SUGGESTED ANSWER:** (c)

**Wrong answers:**

- a) Certainly the Earth's gravitational force effects the Moon. But this force causes the Moon and things on its surface to fall toward the Earth not to the center of the Moon. Since the Moon and the things on its surface are falling toward the Earth, they are in free-fall and weightless relative to the Earth.  
 b) This could be seen to be wrong simply by recalling the gravitational force law. But it can also be deduced to be wrong. If it were mass times radius squared, then small mass and small radius would result in smaller surface gravity than 1/60 of Earth's.  
 d) A red herring. The Moon doesn't have much magnetic field anyway.  
 e) This is the Thanksgiving answer. It doesn't work in the spring term.

**Redaction:** Jeffery, 2001jan01

012 qmult 00230 1 1 3 easy memory: far side of the Moon

8. The far side of the Moon is:

a) seen from Earth once per month.      b) seen from Earth only at new moon.      c) never seen from Earth.  
 d) seen from Earth only during solar eclipses.      e) constantly visible from Earth.

**SUGGESTED ANSWER:** (c)

**Wrong answers:**

- e) Exactly wrong.

**Redaction:** Jeffery, 2001jan01

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012 qmult 00240 1 4 1 easy deducto-memory: lunar sky

9. The sky on the Moon is always:

- a) black.
- b) blue.
- c) red.
- d) red and white.
- e) red, white, and blue.

**SUGGESTED ANSWER:** (a)

The Moon has virtually no atmosphere. Hence the light from astronomical sources will not be scattered about. The surface is brightly illuminated during the day, but the sky still looks black and stars can be seen???. Well maybe not. They are as bright as at night, but eyes or cameras adjusted to bright conditions may not be able to see them.

**Wrong answers:**

- b) Nah, nah, that's the Earth.
- c) True the Soviets did send the first probes around the Moon and to its surface.
- d) Canada has no lunar specialties.
- e) "Hurrah for the red, white, and blue, da da dada, da da dada"—John Philip Sousa forever.

**Redaction:** Jeffery, 2001jan01

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012 qmult 00300 1 1 4 easy memory: lunar geology different from Earth

10. The geology of the Moon is quite different than that of the Earth. There is **NO** evidence that there is or ever was \_\_\_\_\_ and \_\_\_\_\_.

- a) water and wind erosion; volcanism
- b) impact erosion; plate tectonics
- c) impact erosion; volcanism
- d) water and wind erosion; plate tectonics
- e) glaciation; volcanism

**SUGGESTED ANSWER:** (d)

**Wrong answers:**

- a) There is no volcanism on the Moon now, but there was in the past. It gave rise to the maria and the lunar domes.

**Redaction:** Jeffery, 2013jan01

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012 qmult 00320 1 1 2 easy memory: the lunar maria

11. Mare is Latin for "sea": the last "e" is not silent, but the pronunciation seems various—mar-ray may be closest—and who knows how the Romans really pronounced it. The plural form maria is more commonly used, often as if it were a singular. A lunar mare is:

- a) a region of the light colored lunar highlands.
- b) a dark lava plain on the Moon that is **LIGHTLY** cratered compared to the lighter colored lunar highlands.
- c) a dark lava plain on the Moon that is **HEAVILY** cratered compared to the lighter colored lunar highlands.
- d) a seabed of a dried up lunar sea.
- e) the mother of a colt.

**SUGGESTED ANSWER:** (b)

Sea bed or seabed? Barnhart (Ba-1092) fails me. But Wiktionary comes through: <http://en.wiktionary.org/wiki/seabed> .

**Wrong answers:**

- e) Not the best answer in the context of this course or this question.

**Redaction:** Jeffery, 2001jan01

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012 qmult 00310 1 4 2 easy deducto-memory: lunar highlands

12. “Let’s play *Jeopardy!* For \$100, the answer is: They constitute the original lunar crust that formed during the chemical differential phase of the Moon’s formation. They are made of relatively light colored anorthosite rock. Since formation they have been heavily modified by impact erosion by impactors of all sizes. Most of the erosion happened early on in the first billion years of the Moon’s history.”

What are the lunar \_\_\_\_\_, Alex?

- a) maria    b) highlands    c) lowlands    d) seas    e) craters

**SUGGESTED ANSWER:** (b)

**Wrong answers:**

- a) As Lurch would say AAAARGH.

**Redaction:** Jeffery, 2013jan01

012 qmult 00370 2 1 5 moderate memory: the lunar mountains

13. The lunar mountains seem to be:

- a) fold- and fault-mountains, impact crater rims or parts thereof, and hotspot volcanoes.  
 b) fold- and fault-mountains and hotspot volcanoes.  
 c) fold- and fault-mountains.  
 d) impact crater rims or parts thereof and many hotspot volcanoes.  
 e) mainly impact crater rims and parts thereof. There are also central crater peaks and some lunar domes (a kind of shield volcano).

**SUGGESTED ANSWER:** (e)

**Wrong answers:**

- c) Large fold- and fault-mountain chains require plate tectonics although smaller scale ones may exist on Venus which doesn’t seem to have any plate tectonics.

**Redaction:** Jeffery, 2001jan01

012 qmult 00500 1 1 4 easy memory: moonquake definition

14. A moonquake is:

- a) a wobble of the Moon in its orbit.    b) a lunar mare.    c) a fluctuation in the Moon’s reflected brightness caused by a strong gust of the solar wind.  
 d) the Moon’s equivalent of an earthquake.    e) a contradiction in terms.

**SUGGESTED ANSWER:** (d)

**Wrong answers:**

- e) No its not. A Moon earthquake is a contradiction in terms.

**Redaction:** Jeffery, 2001jan01

012 qmult 00600 2 1 4 easy memory: moonquake cause

15. Most significant moonquakes (in the present epoch) are thought to be caused primarily by:

- a) plate tectonic activity.    b) volcanism.    c) impacts and volcanism.    d) impacts and solar tidal force effects.  
 e) the solar wind.

**SUGGESTED ANSWER:** (d)

Most people should know that geological activity like plate tectonics and volcanism (which on Earth is usually associated with plate tectonics) don’t happen on the modern moon.

See FK-218–219: they discuss tidal force and impact moonquakes. The landslide moonquakes must occur too, but they may often not be independent events: i.e., they may be induced by impact or tidal force moonquakes usually. However, a few independent landslide moonquakes probably do occur. The expansion and contraction of rock during the daily heating and cooling cycle can probably induce landslides and concomitant moonquakes sometimes.

**Wrong answers:**

- e) The solar wind seems unlikely now doesn’t it.

**Redaction:** Jeffery, 2001jan01

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012 qmult 00700 1 1 5 easy memory: Moon giant impactor

16. The current favored theory for the formation of the Moon is the:

- a) co-accretion theory.
- b) tidal coupling theory.
- c) capture theory.
- d) fission theory.
- e) giant impactor theory.

**SUGGESTED ANSWER:** (e)

**Wrong answers:**

- c) The capture idea seems dynamically unlikely to those who know how celestial mechanics works.

**Redaction:** Jeffery, 2001jan01

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012 qmult 00800 3 1 3 hard memory: giant impactor formation of Moon

17. The giant impactor theory of the Moon's formation explains:

- a) the heavy cratering of the Moon, the lunar maria, and the inclination of the Earth's axis.
- b) the relatively low uncompressed mean density of the Moon compared to that of the Earth and the existence of the lunar maria.
- c) the relatively low uncompressed mean density of the Moon compared to that of the Earth and the similar composition of the Earth and lunar crusts and mantles.
- d) the relatively low uncompressed mean density of the Moon compared to that of the Earth and the length of the lunar month.
- e) the heavy cratering of the Moon, the lunar maria, and the chemical differentiation of the lunar material.

**SUGGESTED ANSWER:** (c)

See Se-418 for estimated uncompressed densities. The uncompressed densities are a more direct measure of the composition. I think the uncompressed densities can be estimated without specifying the composition to fully and so using them isn't entirely circular.

**Wrong answers:**

- e) These is explained by the heavy bombardment and the internal heat of the Moon.

**Redaction:** Jeffery, 2001jan01

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012 qmult 00900 1 5 5 easy thinking: lunar crater age

18. How can one tell if a large lunar crater is comparatively old or young?

- a) An old crater has dry water channels flowing from the rim both outward to the surroundings and inward toward the crater center. Young craters formed after all the lunar water was gone and so have no dry water channels.
- b) The older the crater, the more ice has accumulated in the crater center. The ice comes from water vapor that is released by comet impacts. The ice condenses in the cold crater centers. There have probably been hundreds of comet impacts since geological activity stopped on the Moon. The ice is **EASILY SEEN** from the Earth because of its high reflectivity.
- c) The older the crater, the more ice has accumulated in the crater center. The ice comes from water vapor that is released by comet impacts. The ice condenses in the cold crater centers. There have probably been hundreds of comet impacts since geological activity stopped on the Moon. The ice is covered by regolith and is **NOT EASILY SEEN** from the Earth. The ice was detected in the 1990's by radar techniques and by studying the speed of neutron emission from the lunar surface. (Energetic solar wind particles cause the lunar surface to emit neutrons.)
- d) The older the crater, the greener it looks.
- e) The older the crater, the more heavily it itself tends to be cratered.

**SUGGESTED ANSWER:** (e)

The right answer is pretty clearly right although there are other ways of differentiating old and young craters. See Se-446 and Se-448.

**Wrong answers:**

- a) No evidence exists for there ever being flowing water on the Moon.

- b) There some evidence for ice on the Moon from comet impacts (though I'm guessing with the hundreds number), but it is only suspected in polar craters where the Sun never shines: i.e., polar craters. Thus having ice is not an evidence of age. The ice is not visible from Earth. In fact, in 2003nov, it was reported that the best radar analysis suggested there couldn't be a lot of ice. A little ice was still possible.
- c) Same remarks as for (c), except that the discovery of the ice is I think as described, but I havn't check the details in detail.
- d) The green cheese model of the Moon is defunct.

**Redaction:** Jeffery, 2001jan01

012 qmult 01200 2 1 4 moderate memory: regolith

19. Lunar regolith is lunar rock ground down to fragments and dust by:

- a) volcanic action.
- b) strong winds present on the early Moon.
- c) the solar wind.
- d) space weathering (mainly micrometeoritic impacts and fragmentation by the diurnal temperature cycling).
- e) the cosmic microwave background (CMB).

**SUGGESTED ANSWER:** (d)

But I think the answer is deducible too at least from the longest-answer-is-the-right-answer rule. Se-452, none too clearly, says the regolith is the dust or lunar soil, not the larger fragments. The other books, even Lewis, p. 386 are equivocal. See HI-142.

**Wrong answers:**

- a) Volcanic action has long stopped on the Moon. Sometimes it creates volcanic ash I think.
- b) Maybe plausible, but no one has talked about strong lunar winds.
- c) The Solar wind is atomic. I don't think it can pulverize.
- e) Does this sound plausible?

**Redaction:** Jeffery, 2001jan01

012 qmult 01310 2 4 1 moderate deducto-memory: roundness and cratering

20. Until about the middle of the 20th century most geologists thought the lunar craters were mostly volcanic. This was so because it was thought that impact craters:

- a) could not be mostly so round as almost all lunar craters appeared to be.
- b) had to be mostly so round as almost all lunar craters appeared to be.
- c) could not be on top of mountains as almost all lunar craters appeared to be.
- d) had to be on top of mountains as almost all lunar craters appeared to be.
- e) had to be squarish unlike lunar craters.

**SUGGESTED ANSWER:** (a) A somewhat convoluted sentence, but it works. See FMW-173

**Wrong answers:**

- b) This answer gives a fact that contradicts the conclusion it was meant to prove. No doubt Aristotle has a name for this logical fallacy.

**Redaction:** Jeffery, 2001jan01

012 qmult 01400 2 4 4 moderate deducto-memory: first humans on the Moon

21. Astronauts **FIRST** landed on the Moon in:

- a) 1962.
- b) 1984.
- c) 1958.
- d) 1969.
- e) 1948.

**SUGGESTED ANSWER:** (d)

A super easy question, except for those students who regard the lunar landings in the same category Lindbergh's trans-Atlantic solo flight: i.e., one with Nineveh and Tyre.

The entire era of humans on the Moon was only 1969–1972.

**Wrong answers:**

- c) Great year. Superb vintage and all that.

**Redaction:** Jeffery, 2001jan01

012 qmult 01900 1 4 4 easy deducto-memory: fate of the Moon

22. In future gigayears, the Moon:

- a) will have an eventful history with volcanism and outgassing. It will develop a dense CO<sub>2</sub> atmosphere and become like Venus is today.
- b) will split into tiny fragments and become a ring around the Earth. The ring will be rocky, and so less bright than Saturn's icy ring.
- c) will crash into the Earth. This will probably end life on Earth.
- d) will continue to suffer slow space weather and occasionally large impacts. The Moon's appearance will probably change only slowly and it might look roughly much the same as it does now when the Sun in its red giant phase or its asymptotic giant branch (AGB) phase envelops and vaporizes the Moon along with the Earth.
- e) will turn into green cheese finally and become Santa's new home after the north polar cap melts.

**SUGGESTED ANSWER:** (d)

**Wrong answers:**

- e) This is the Christmas answer.

**Redaction:** Jeffery, 2001jan01

012 qmult 10100 1 1 3 easy memory: Mercury closest to the Sun

23. Mercury is:

- a) the largest rocky (or terrestrial) planet.
- b) the least cratered rocky (or terrestrial) planet.
- c) the closest planet to the Sun.
- d) always the brightest planet visible from the Earth.
- e) the red planet.

**SUGGESTED ANSWER:** (c) This is super-easy.

**Wrong answers:**

- e) The red planet is Mars.

**Redaction:** Jeffery, 2001jan01

012 qmult 10210 1 4 2 easy deducto-memory: Mercury's size

24. Among the rocky (or terrestrial) planets, Mercury is:

- a) largest.
- b) smallest.
- c) most massive.
- d) farthest from the Sun.
- e) reddest.

**SUGGESTED ANSWER:** (b) I think Pluto must be counted as an icy-rocky body, not a rocky body.

**Wrong answers:**

- e) Mars is reddest by most standards.

**Redaction:** Jeffery, 2001jan01

012 qmult 10240 1 4 1 easy deducto-memory: mercury's 3:2 spin resonance

25. "Let's play *Jeopardy!* For \$100, the answer is: This Solar System body has 3:2 spin-orbit resonance (i.e., rotates 3 times relative to the fixed stars for every two orbits) due to complicated gravitational effects."

What is \_\_\_\_\_, Alex?

- a) Mercury
- b) the Moon
- c) Io
- d) Charon
- e) Lead

**SUGGESTED ANSWER:** (a)

**Wrong answers:**

- b) The Moon is synchronously tidally locked to the Earth.
- c) Io is synchronously tidally locked to Jupiter
- d) Charon is synchronously tidally locked to Pluto and in addition Pluto is synchronously tidally locked to Charon (Cox-297, 305, 308).



- e) Lead is a dense metal. Mercury in another context is a dense metal too. But under Earth surface conditions Mercury is a liquid which is a unique condition for a metal (Cl-52,53).

**Redaction:** Jeffery, 2001jan01

012 qmult 10300 2 4 3 moderate deducto-memory: Mercury's iron content

26. Based on the theory of planet formation we would expect Mercury to be richer in **RELATIVE** iron abundance than:

- a) Jupiter, but not Earth.      b) icy planetesimals, but not Earth.      c) Earth.      d) Earth, but not the Sun.  
e) Mars, but not the Sun.

**SUGGESTED ANSWER:** (c)

The students have to have caught that there will be a higher ratio of metallic matter to rocky the closer the formation was to the Sun. But Se-462 says this effect may be insufficient to explain just how rich Mercury is in iron. Maybe a giant impactor knocked off much of the silicate-rich mantle after Mercury formed.

**Wrong answers:**

- e) The Sun is very low in iron abundance because its huge abundances of hydrogen and helium.

**Redaction:** Jeffery, 2001jan01

012 qmult 10400 1 4 4 easy deducto-memory: Mercury's atmosphere

27. Mercury has:

- a) a thick, dry, carbon dioxide atmosphere.  
b) a water vapor atmosphere which is thick enough to to cause clouds that are sometimes seen from Earth.  
c) a thin, but nearly breathable, oxygen-nitrogen atmosphere.  
d) almost no atmosphere.  
e) a thick atmosphere of nearly transparent molecular hydrogen gas.

**SUGGESTED ANSWER:** (d)

Well the longest-answer-is-the-right-answer rule fails here. Everyone who has read the book, been to the lectures, or has reasonable general knowledge knows that Mercury is almost airless. It can't be said to be completely airless, because an extremely tenuous atmosphere does exist, that has practically no effect on anything.

**Wrong answers:**

- e) Well no.

**Redaction:** Jeffery, 2001jan01

012 qmult 10410 1 4 1 easy deducto-memory: Mercury's lava plains

28. Mercury has lava plains somewhat like the Moon's maria, but these Mercurian plains:

- a) are not so dark and noticeable.      b) cover all the Mercurian impact craters.      c) are very much darker than the lunar maria.      d) are green.      e) are green because they are covered with vegetation.

**SUGGESTED ANSWER:** (a) See Se-460–461.

**Wrong answers:**

- e) Mercury is barren.

**Redaction:** Jeffery, 2001jan01

012 qmult 10500 2 4 2 moderate deducto-memory: weird terrain

29. "Let's play *Jeopardy!* For \$100, the answer is: The focusing of seismic waves at the antipodal point from Caloris Basin impactor impacted on Mercury is believed to have caused this geological feature at the antipodal point."

What is \_\_\_\_\_, Alex?

- a) an impact basin    b) jumbled weird terrain    c) a lobate scarp    d) a normal scarp  
e) a magnetic field

**SUGGESTED ANSWER:** (b)

**Wrong answers:**

- a) Contact force: no way.

**Redaction:** Jeffery, 2001jan01

012 qmult 10600 2 4 4 moderate deducto-memory: Mercury's lobate scarps

30. Features that are prominent on Mercury, but are comparatively small and inconspicuous on the Moon, are:

- a) giant lava-flooded impact basins such as the Orientale Basin.    b) geysers.    c) impact craters of tens of kilometers in diameter.    d) lobate scarps that can stretch over hundreds of kilometers.    e) volcanic craters.

**SUGGESTED ANSWER:** (d)

**Wrong answers:**

- a) The Orientale Basin is on the Moon, but it is a giant lava-flooded impact basin. The Caloris Basin is a giant lava-flooded impact basin on Mercury.

**Redaction:** Jeffery, 2001jan01

012 qmult 11000 3 1 3 tough memory: Mercury's rotation Doppler effect

31. The rotational period of Mercury was measured in 1965 by reflecting a radio pulse with a range of frequencies (i.e., a frequency band) off of Mercury's surface. But what physical effect allows the measurement of rotation from the reflection of a radio pulse that is sent with a particular intensity and frequency band?

- a) The time interval for a pulse to return increases as a planet's rotation increases.  
b) The intensity of a returning pulse decreases as a planet's rotation rate increases. This is caused by the Doppler effect.  
c) The width of the frequency band of a returning pulse increases as a planet's rotation rate increases. This is caused by the Doppler effect.  
d) A returning pulse is divided into three frequency bands if there is rotation. The size of the frequency difference between the bands increases as a planet's rotation rate increases. This is caused by the Doppler effect.  
e) If there is rotation, a returning radio pulse makes a gobble-gobble sound.

**SUGGESTED ANSWER:** (c)

The student has to grasp frequency band, has to recall the Doppler effect without the name. They have to understand that some of the planet is moving away and some is moving toward in rotation, and thus there will be Doppler broadening. Deduction can help. Note Se-458 says nothing about range of frequencies, but there always is some range even if it is minute. It makes the question clearer to mention range.

**Wrong answers:**

- a) The speed of light is a constant and so is the time interval provided the distance is constant.  
d) Have we ever discussed division into three bands.  
e) This is the Thanksgiving joke answer. It doesn't work in the spring term.

**Redaction:** Jeffery, 2001jan01