

Lab Game

Question Type: Short Answer
Name : _____ Question Rating: 2
Possible Cost: 1

Helper: _____

Question:
When does the third quarter moon rise?

Answer: _____ 1

Question Type: Short Answer
Name : _____ Question Rating: 2
Possible Cost: 1

Helper: _____

Question:
When a photon interacts with an atom, a second photon of the same frequency may be emitted if the atom was already excited. What common device does this?

Answer: _____ 2

Question Type: Short Answer
Name : _____ Question Rating: 2
Possible Cost: 1

Helper: _____

Question:
Which early scientist/astronomer was the first to use a telescope to observe objects in the sky?

Answer: _____ 3

Question Type: Short Answer
Name : _____ Question Rating: 2
Possible Cost: 1

Helper: _____

Question:
The Andromeda galaxy is about 2.5 million light years from the Earth. How long ago did the light we see now from Andromeda leave that galaxy?

Answer: _____ 4

Question Type: Short Answer
Name : _____ Question Rating: 2
Possible Cost: 1

Helper: _____

Question:
An astronomical unit (AU) is the average distance between what 2 objects?

Answer: _____ 5

Question Type: Short Answer
Name : _____ Question Rating: 2
Possible Cost: 1

Helper: _____

Question:
What is GSU's \$20 million telescope that is capable of making super-high resolution images of stars called?

Answer: _____ 6

Lab Game

Name : _____ Question Type: Short Answer
Question Rating: 2
Possible Cost: 1

Helper: _____

Question:
The atomic number of Iron is 26. How many protons does Iron have?

Answer: _____ 7

Name : _____ Question Type: Short Answer
Question Rating: 2
Possible Cost: 1

Helper: _____

Question:
The moon orbits the earth in approximately one month, moving in the same direction as the earth orbits the sun. Thinking about the relation between phase, position and time of day, about when would a first-quarter moon rise?

Answer: _____ 8

Name : _____ Question Type: Short Answer
Question Rating: 2
Possible Cost: 1

Helper: _____

Question:
What is an astronomical unit?

Answer: _____ 9

Name : _____ Question Type: Short Answer
Question Rating: 2
Possible Cost: 1

Helper: _____

Question:
Who discovered the largest moons of Jupiter?

Answer: _____ 10

Name : _____ Question Type: Short Answer
Question Rating: 2
Possible Cost: 1

Helper: _____

Question:
Suppose that two stars are separated in the sky by 0.1 arcsecond. If you look at them with a telescope that has an angular resolution of 0.5 arcsecond, what will you see?

Answer: _____ 11

Name : _____ Question Type: Short Answer
Question Rating: 2
Possible Cost: 1

Helper: _____

Question:
Name the Jovian (gas giants) planets.

Answer: _____ 12

Lab Game

Question Type: Short Answer
Question Rating: 2
Possible Cost: 1

Name : _____

Helper: _____

Question:
Name the terrestrial planets.

Answer: _____ 13

Question Type: Short Answer
Question Rating: 2
Possible Cost: 1

Name : _____

Helper: _____

Question:
List the Earth's constituent regions, ordered from inside out.

Answer: _____ 14

Question Type: Short Answer
Question Rating: 2
Possible Cost: 1

Name : _____

Helper: _____

Question:
What squeezes planets into a round shape?

Answer: _____ 15

Question Type: Short Answer
Question Rating: 2
Possible Cost: 1

Name : _____

Helper: _____

Question:
What planets do the Galilean moons orbit?

Answer: _____ 16

Question Type: Short Answer
Question Rating: 2
Possible Cost: 1

Name : _____

Helper: _____

Question:
What is the great red spot on Jupiter?

Answer: _____ 17

Question Type: Mathematics
Question Rating: 2
Possible Cost: 0

Name : _____

Helper: _____

Question:
Given that the radius of Jupiter is 68,700 km and the radius of Venus is 6.05×10^8 cm, what is the ratio of Venus' radius to Jupiter's?

Show Work on Back!

Answer: _____ #8

Lab Game

Name : _____ Question Type: Mathemagics
Question Rating: 2
Possible Cost: 0

Helper: _____

Question:
If the half-life of an isotope is 30 years, and you start out with a sample of 1,000 atoms of that isotope, about how many will be left after 90 years?

Show Work on Back!

Answer: _____ 19

Name : _____ Question Type: Mathemagics
Question Rating: 2
Possible Cost: 0

Helper: _____

Question:
If you drop a stone from a tall building, roughly how fast will it be falling 1 second after you have released it?

Show Work on Back!

Answer: _____ 20

Name : _____ Question Type: Mathemagics
Question Rating: 2
Possible Cost: 0

Helper: _____

Question:
Kepler found that the period (P) of a planet's orbital motion around the sun was related to the planet's "average" distance (a) from the sun according to the following proportionality: $P^2 \propto a^3$. What would be the approximate period for a planet located at 5 times the earth's distance from the sun?

Show Work on Back!

Answer: _____ 21

Name : _____ Question Type: Mathemagics
Question Rating: 2
Possible Cost: 0

Helper: _____

Question:
How long does it take light to reach Venus from the Sun.
[Hint: $c=300,000$ km/s, Venus is .7 AU from sun]

Show Work on Back!

Answer: _____ 22

Name : _____ Question Type: Mathemagics
Question Rating: 2
Possible Cost: 0

Helper: _____

Question:
Suppose a planet like Earth orbits a star with 4 times the Sun's mass. If that planet also has a semi-major axis of 1 AU, what would its orbital period be? (Hint: $(m_1+m_2)P^2=a^3$)

Show Work on Back!

Answer: _____ 23

Name : _____ Question Type: Mathemagics
Question Rating: 2
Possible Cost: 0

Helper: _____

Question:
Suppose we observe a spectral line at a wavelength of $\lambda = 501$ nm which we identify as one emitted with a rest wavelength of $\lambda_0 = 500$ nm. Then according to the Doppler shift formula ($v = c(\lambda - \lambda_0) / \lambda_0$) the star has a velocity of $v =$ _____ km/sec. [Hint: $c=300,000$ km/sec].

Show Work on Back!

Answer: _____ 24

Lab Game

Name : _____ Question Type: Mathemagics
Question Rating: 2
Possible Cost: 0

Helper: _____

Question:
Pluto has an aphelion distance of ~49 AU and a perihelion distance of ~31 AU How long is the dwarf planet's orbital period?

Show Work on Back!

Answer: _____ 25

Name : _____ Question Type: Mathemagics
Question Rating: 2
Possible Cost: 0

Helper: _____

Question:
One night, you see the star Sirius rise at exactly 7:36P.M. What time will it rise the next night?

Show Work on Back!

Answer: _____ 26

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: A true science must allow for hypotheses to be tested, and if found to contradict newer experiments or observations, the hypotheses should be modified or discarded.

Answer: _____ 27

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: One of Ptolemy's main contributions to astronomy consisted of writing down and summarizing the discoveries of earlier Greek astronomers.

Answer: _____ 28

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: An astronomer living at 60° N latitude will see fewer different stars during the course of a year than will an astronomer living at 30° N latitude.

Answer: _____ 29

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: Kepler's third law says that a planet moves fastest when closest to the Sun.

Answer: _____ 30

Lab Game

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: If the Moon's mass suddenly became only half of what it actually is, the gravitational force between the Earth and the Moon would be halved.

Answer: _____ 31

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Which of the following situations describe an acceleration:

- a) a planet traveling around the Sun
- b) a car traveling at a constant speed down a straight street
- c) a car decreasing speed while traveling down a straight street
- d) a car waiting at a stop light for the light to turn green
- e) both (a) and (c) are accelerations

Answer: _____ 34

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
On the vernal (spring) equinox

- a) the number of hours of light equals the number of hours of dark
- b) the Sun crosses the Celestial Equator moving from South to North
- c) the Sun rises due East and sets due West
- d) both (a) and (c) are true
- e) all of (a), (b), and (c) are true

Answer: _____ 32

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Galileo used his telescope to discover all but which of the following:

- a) the phases of Venus
- b) the mountains on the Moon
- c) the rings of Saturn
- d) the rotation of the Sun
- e) the moons of Jupiter

Answer: _____ 35

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
A total solar eclipse can only occur when:

- a) the Moon's phase is new.
- b) The line of intersection of the Earth's and Moon's orbital planes (line of nodes) runs through the Sun.
- c) the Moon is at perigee (perigee is when a satellite is closest to its planet).
- d) Both (a) and (b), but not (c), are necessary.
- e) All of (a), (b) and (c) are necessary.

Answer: _____ 33

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Visible light can be considered to be

- a) a transverse electromagnetic wave
- b) a longitudinal electromagnetic wave
- c) a particle called a photon
- d) both (a) and (c) can be correct
- e) both (b) and (c) can be correct

Answer: _____ 36

Lab Game

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: A CCD (charge coupled device) is more linear than film, and is therefore preferred for accurate measurements of brightness.

Answer: _____ 37

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: Jupiter is about 11 times the radius of the Earth and about 30 times its mass.

Answer: _____ 38

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: Radioactive decay allows us to date rocks on the Earth back to about 4 billion years but lunar rocks older than that were brought back by Apollo astronauts.

Answer: _____ 39

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: A photon with a wavelength in vacuum of $5.0 \times 10^{-5}\text{cm}$ has twice the energy of one with a wavelength in vacuum of $2.5 \times 10^{-5}\text{cm}$.

Answer: _____ 40

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: Kirchhoff's laws include the idea that a liquid basically produces a continuum thermal spectrum.

Answer: _____ 41

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Which of the following is true of the continuous spectrum emitted from a body at about 293K(68° F)?

- a) It emits electromagnetic radiation at all wavelengths, but the emission peaks in the visible.
- b) It emits electromagnetic radiation at all wavelengths, but the emission peaks in the IR.
- c) It emits mostly visible radiation
- d) It only emits IR and radio photons
- e) It mainly emits X-rays.

Answer: _____ 42

Lab Game

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The solar nebula condensed to form planetesimals in a flattened disk because of

- a) the law of conservation of angular momentum
- b) Newton's law of gravity
- c) collisions between planetesimals tend to lose momentum perpendicular to the disk plane
- d) (a) and (b) are both important
- e) All of (a), (b), and (c) are important

Answer: _____ 43

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Lunar eclipses only occur

- a) when the moon passes within Earth's shadow
- b) when the moon passes behind the Sun.
- c) during new moon.
- d) At midnight.

Answer: _____ 46

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
A mountain top is a good location for optical and infrared telescopes because the site

- a) is above much of the atmosphere
- b) is closer to astronomical objects
- c) has cold weather which improves the performance of all instruments
- d) all of (a), (b), and (c)
- e) none of (a), (b), and (c)

Answer: _____ 44

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The Earth's rotation axis is inclined by 23.5 degrees relative to what?

- a) The Sun's rotation axis
- b) the axis defined by the Sun's orbit around the center of the galaxy
- c) the axis defined by Earth's orbit around the Sun
- d) the axis defined by the Moon's orbit around the Earth

Answer: _____ 47

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Planet A has twice the radius of planet B, but only $\frac{1}{2}$ B's surface temperature (assume neither has an atmosphere). Therefore the ratio of the luminosity of A to that of B (L_A/L_B) is:

- a) 16
- b) 4
- c) 1
- d) $\frac{1}{4}$
- e) $\frac{1}{16}$

Answer: _____ 45

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Which of the following is not one of Kepler's 3 Laws of Planetary Motion?

- a) $F = ma$
- b) a planet sweeps out equal area in equal time as it moves along its orbital path
- c) $P^2 = a^3$
- d) the orbital paths of the planets are ellipses

Answer: _____ 48

Lab Game

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
If you were standing on the equator, the point on the celestial sphere directly overhead would correspond to
a) your zenith.
b) the south celestial pole.
c) the approximate position of the star Polaris.
d) your horizon.

Answer: _____ 49

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____


Question:
If tonight there is a full moon, approximately 2 weeks later, there will be
a) a 1st quarter moon
b) a 3rd quarter moon
c) a new moon
d) another full moon

Answer: _____ 52

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The image below shows a partially blocked view of the sun, as seen from Earth. This is
a) a lunar eclipse, caused by Earth blocking some sunlight from striking the moon.
b) A lunar eclipse, caused by the moon blocking some sunlight from striking the Earth.
c) A solar eclipse, caused by Earth blocking some sunlight from striking the moon.
d) A solar eclipse, caused by the moon blocking some sunlight from striking the Earth.



Answer: _____ 50

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
What coordinate do astronomers use to measure the angular distance of a star above or below the celestial equator?
a) Declination
b) astronomical unit
c) right ascension
d) precession

Answer: _____ 53

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
When do Mars and the moon appear to be about the same size in the sky?
a) Every time the Earth passes by Mars in its orbit (in other words, at closest approach)
b) every time Mars is between the Earth and the sun
c) every full moon
d) Mars never appears to be as big as the moon

Answer: _____ 51

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Which is largest?
a) The distance from Earth to the moon
b) the distance to the nearest star (excluding the sun), proxima centauri
c) an astronomical unit
d) a light year

Answer: _____ 54

Lab Game

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
About how big is the observable universe?

- a) 14 billion km
- b) 14 billion astronomical units
- c) 14 billion light years
- d) the observable universe is infinite

Answer: _____ 55

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The Copernican Revolution refers to

- a) the Polish Revolutionary war started by Copernicus and other nerdy thugs.
- b) A renewed scientific interest in the sun-centered model of the solar system.
- c) The discovery of the element copper.
- d) Copper being used to help make telescopes

Answer: _____ 58

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
You may have heard the claim that the spring equinox is the only day of the year on which you can balance an egg on its end. Despite being false, this claim can still be considered a scientific claim. What makes it scientific?

- a) The spring equinox has to do with astronomy, which is a science
- b) the claim makes a testable prediction
- c) the claim is usually stated by folks with some knowledge of science
- d) on the spring equinox, sunlight strikes both hemispheres equally

Answer: _____ 56

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Which of the following phenomenon, if any, explains why in 13,000 years the north celestial pole will not be in the direction of Polaris?

- a) Expansion of the universe
- b) retrograde motion of the planets
- c) precession of Earth's axis
- d) none, because the north celestial pole will always be in the direction of Polaris

Answer: _____ 59

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Which of the following observations made by Galileo helped confirm that Earth is not the center of our solar system?

- a) Lunar eclipses
- b) solar eclipses
- c) Venus has phases, similar to the moon
- d) The moon always keeps the same side facing Earth.

Answer: _____ 57

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
During the northern hemisphere's summer, at which location on Earth could the sun be considered a circumpolar star?

- a) Atlanta, GA
- b) the equator
- c) the north pole
- d) the south pole

Answer: _____ 60

Lab Game

Question Type: Multiple Choice
 Name : _____ Question Rating: 1
 Possible Cost: 2

Helper: _____

Question:
 The position of the sun in the sky over the course of a year will always remain

- on the celestial equator
- on the ecliptic
- in the direction Polaris, or the north celestial pole
- in the same constellation

Answer: _____ 61

Question Type: Multiple Choice
 Name : _____ Question Rating: 1
 Possible Cost: 2

Helper: _____

Question:
 It's mid-September, and the sun has just come above the horizon, having been below the horizon for the last 6 months. Where, if anywhere, are you on Earth?

- The north celestial pole
- The north pole
- The south pole
- This never happens on Earth

Answer: _____ 64

Question Type: Multiple Choice
 Name : _____ Question Rating: 1
 Possible Cost: 2

Helper: _____

Question:
 How did the Earth-centered model of the solar system proposed by Ptolemy attempt to explain the apparent retrograde motion of the planets?

- It did not, which is why it was quickly rejected
- It claimed that the planets orbit at different speeds.
- It claimed that the planets traveled on retrograde loops (or epicycles) superimposed on their orbital paths.
- It claimed that the center of the solar system precesses from one planet to another

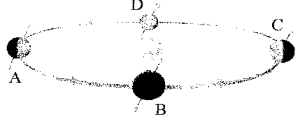
Answer: _____ 62

Question Type: Multiple Choice
 Name : _____ Question Rating: 1
 Possible Cost: 2

Helper: _____

Question:
 The given diagram indicates 4 position of the Earth in its orbit around the sun, each labeled A, B, C, or D. At which position would the southern hemisphere be experiencing summer?

- A
- B
- C
- D



Answer: _____ 65

Question Type: Multiple Choice
 Name : _____ Question Rating: 1
 Possible Cost: 2

Helper: _____

Question:
 The stars in a constellation

- are at similar distances
- may be at very different distances
- all orbit one another, just like the planets orbit the sun.
- are the brightest stars within that galaxy

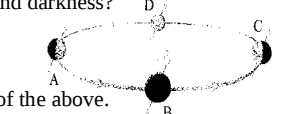
Answer: _____ 63

Question Type: Multiple Choice
 Name : _____ Question Rating: 1
 Possible Cost: 2

Helper: _____

Question:
 The given diagram indicates 4 position of the Earth in its orbit around the sun, each labeled A, B, C, or D. At which position, if any, do all the parts of the Earth receive equal amounts of daylight and darkness?

- A
- B
- C
- None of the above.



Answer: _____ 66

Lab Game

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
A full moon will always rise at about

- a) sunset
- b) midnight
- c) sunrise
- d) midday

Answer: _____ 67

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Which of these lists is correctly ordered from lowest to highest energies?

- a) Radio waves, blue light, red light
- b) radio waves, infrared light, ultraviolet light
- c) X-rays, red light, blue light
- d) X-rays, blue light, red light

Answer: _____ 68

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
If a constant net force is applied to a rocket ship in space, it will

- a) only move if the force applied is much greater than its mass
- b) move at a constant velocity
- c) accelerate, and its rate of acceleration will continually increase
- d) accelerate, and its rate of acceleration will stay the same

Answer: _____ 69

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
What do we mean by the diffraction limit of a telescope?

- a) It describes the maximum exposure time for images captured with the telescope.
- b) It is the best angular resolution the telescope could achieve with perfect optical quality and in the absence of atmospheric distortion.
- c) It describes the farthest distance to which the telescope can see.
- d) It is the maximum size to which any telescope can be built

Answer: _____ 70

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Since the universe is expanding, the light we receive from distant galaxies will be

- a) redshifted
- b) blueshifted
- c) moving faster than the speed of light
- d) moving slower than the speed of light

Answer: _____ 71

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
You are standing on a scale in an elevator. Suddenly you notice your weight decreases. What do you conclude?

- a) The elevator is moving at a constant velocity upwards.
- b) The elevator is accelerating downwards.
- c) The elevator is moving at a constant velocity downwards.
- d) The elevator is accelerating upwards.

Answer: _____ 72

Lab Game

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Adaptive optics is a technique for
a) identifying elements by observing their “chemical fingerprints” in spectra.
b) Making lenses transparent to wavelengths of light besides just visible light.
c) Dispersing light into its component colors.
d) Correcting for image distortions caused by turbulence in the atmosphere

Answer: _____ 73

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

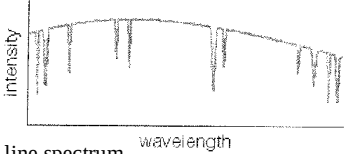
Question:
We can see each other in the lab room right now because we
a) absorb visible light
b) reflect visible light
c) emit thermal radiation
d) emit infrared light

Answer: _____ 76

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
This spectrum illustrates
a) a continuous spectrum.
b) an emission line spectrum.
c) an absorption line spectrum.
d) a continuous and an emission line spectrum.



Answer: _____ 74

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The Keck Telescope in Hawaii has a diameter of 10 meters. How does its collecting area compare to that of the Hale Telescope in California, with a diameter of 5 meters?
a) It is 2 times greater
b) it is 5 times greater
c) it is 4 times greater
d) it is 25 times greater

Answer: _____ 77

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Which of the following uses mirrors to bring light to a focus?
a) A reflecting telescope
b) a refracting telescope
c) a digital camera
d) your eye

Answer: _____ 75

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Why does the moon not fall and crash into Earth?
a) It is far enough away to have escaped Earth's gravity
b) the gravitational force of the sun keeps it from falling to Earth
c) tidal friction
d) it is moving horizontally so quickly that it never hits the Earth as it falls

Answer: _____ 78

Lab Game

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Which of the following represents a case in which you are not accelerating?
a) Driving at a constant 60 miles per hour around a curve
b) driving in a straight line at 60 miles per hour
c) going from 0 to 60 miles per hour in 10 seconds
d) slamming on the brakes to come to a stop at a stop sign

Answer: _____ 79

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Which photon has the longest wavelength?
a) An infrared photon
b) a radio photon
c) a photon of blue light
d) a photon of red light

Answer: _____ 80

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Tides are primarily caused by
a) the moon pulling slightly harder on the side of the Earth facing it.
b) The rapid rotation of the Earth, flinging the oceans outwards.
c) Earth's orbit around the sun being slightly eccentric (that is, not a perfect circle)
d) the moon's orbit around Earth being slightly eccentric.

Answer: _____ 81

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The planet Crapton has the same mass as the Earth and twice the radius of Earth. How would the acceleration due to gravity on the surface of Crapton compare with the acceleration due to gravity on the surface of Earth?
a) It would be the same
b) it would be twice as large
c) it would be four times as large
d) it would be one fourth the amount

Answer: _____ 82

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The planet Crapton has the same mass as the Earth and twice the radius of Earth. How would your weight change on the surface of Crapton compared to your weight on the surface of Earth?
a) It would be the same
b) it would be twice as large
c) it would be four times as large
d) it would be one fourth the amount

Answer: _____ 83

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The planet Crapton has the same mass as the Earth and twice the radius of Earth. How would your mass change on the surface of Crapton compared to your mass on the surface of the Earth?
a) It would be the same
b) it would be twice as large
c) it would be four times as large
d) it would be one fourth the amount

Answer: _____ 84

Lab Game

Question Type: Multiple Choice
 Name : _____ Question Rating: 1
 Possible Cost: 2

Helper: _____

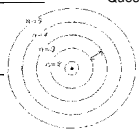
Question:
 The planet Crapton has the same mass as the Earth and twice the radius of Earth. Suppose Crapton has a moon just like the Earth's moon – it has the exact same mass and orbits at the exact same distance from the center of the planet. How would the gravitational force between Crapton and its moon compare to the gravitational force between Earth and its moon?

- The Crapton-moon force would be the same
- The Crapton-moon force would be twice as large
- the Crapton-moon force would be four times as large
- the Crapton-moon force would be one fourth the amount

Answer: _____ 85

Question Type: Multiple Choice
 Name : _____ Question Rating: 1
 Possible Cost: 2

Helper: _____




Question:
 The given diagram represents possible energy levels for an electron of an atom. Suppose that initially this atom is an electrically neutral helium atom. If it then absorbs an X-ray photon with enough energy to complete free 1 electron from the atom, this atom could then be called a

- hydrogen atom (which typically has 1 less electron than a helium atom)
- hydrogen isotope
- helium isotope
- helium ion

Answer: _____ 88

Question Type: Multiple Choice
 Name : _____ Question Rating: 1
 Possible Cost: 2

Helper: _____



Question:
 The given diagram represents possible energy levels for an electron of an atom. How would the energy of the photon released when an electron transitions from the n=3 to the n=2 level, compare to the energy released when an electron transitions from the n=4 to the n=2 level?

- They would be the same
- the n=3 to n=2 photon would have more energy
- the n=4 to n=2 photon would have more energy
- there is not enough information to tell, since the energy released depends on the type of atom it is.

Answer: _____ 86

Question Type: Multiple Choice
 Name : _____ Question Rating: 1
 Possible Cost: 2

Helper: _____


Question:
 When a gun fires a bullet, the bullet and the gun move in opposite directions with the same

- momentum (=mass x velocity).
- Velocity.
- Speed.
- Acceleration.

Answer: _____ 89

Question Type: Multiple Choice
 Name : _____ Question Rating: 1
 Possible Cost: 2

Helper: _____



Question:
 The given diagram represents possible energy levels for an electron of an atom. What keeps electrons bound to the nucleus of atoms?

- They are attracted to the negatively charged protons in the nucleus
- they are attracted to the negatively charged neutrons in the nucleus
- they are attracted to the net positive charge of the nucleus
- gravity

Answer: _____ 87

Question Type: Multiple Choice
 Name : _____ Question Rating: 1
 Possible Cost: 2

Helper: _____

Question:
 If object A is hotter than object B, that means that relative to object B, object A has

- more atoms with electrons transitioning between energy levels.
- more atoms with electrons in higher energy levels.
- more atoms with rapidly spinning electrons.
- faster moving atoms.

Answer: _____ 90

Lab Game

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Which of the following is not an advantage of observing in space (that is, above Earth's atmosphere)?

- a) It permits observations at radio wavelengths
- b) it permits observations at gamma ray wavelengths
- c) it eliminates distortions caused by turbulence in the atmosphere
- d) it eliminates the restriction of only observing at night

Answer: _____ 91

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Which of the following most simply explains why a spinning figure skater will spin faster when she pulls her arms and legs in close to her body?

- a) Newton's second law ($F=ma$)
- b) Newton's first law (Inertia)
- c) Kepler's third law ($P^2=a^3$)
- d) conservation of angular momentum

Answer: _____ 94

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The ultimate source of energy that powers the Sun is

- a) kinetic energy of the orbital motion of the Sun.
- b) chemical potential energy of hydrogen burning into helium.
- c) thermal energy of the hydrogen atoms in the Sun.
- d) mass energy of hydrogen fusing into helium.

Answer: _____ 92

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Two stars are the exact same size, but one is much hotter than the other. Relative to the cooler star, the hotter star

- a) emits more infrared light, but less light at shorter (bluer) wavelengths.
- b) emits more infrared light, but less light at longer (redder) wavelengths.
- c) emits only more ultraviolet light.
- d) emits more light at all wavelengths.

Answer: _____ 95

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
How far does light travel in 1 second?

- a) 300,000 m
- b) 300,000 km
- c) 300,000 km/s
- d) 300,000,000 km/s

Answer: _____ 93

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The spectrum of an incandescent light bulb, which shines because of the very hot tungsten filament on the inside, can be best described as

- a) a continuous spectrum.
- b) an emission line spectrum.
- c) a growth spectrum.
- d) an absorption line spectrum.

Answer: _____ 96

Lab Game

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The angular resolution of your eye, which is sensitive to only visible light, is about 1 arcminute. Suppose that your eye was able to see at other wavelengths. Which wavelength regime would provide you with the ability to see things in even greater detail?
a) Ultraviolet wavelengths
b) infrared wavelengths
c) radio wavelengths
d) none of the above. angular resolution does not depend upon wavelength, it only depends upon the size of your eye.

Answer: _____ 97

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
As seen from Atlanta, the sky appears to rotate daily as a sphere of “fixed” stars around the approximate position of the North Star. Which of these would be true of a star that rises in the southeast?
a) It sets in the southwest, less than 12 hours after rising.
b) It sets in the northwest, less than 12 hours after rising.
c) It sets in the southwest, more than 12 hours after rising.
d) It sets in the northwest, more than 12 hours after rising.,
e) It sets in the southwest, exactly 12 hours after rising.

Answer: _____ 98

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The earth orbits the sun under the influence of the sun's gravity. What would happen to the earth's motion if the sun's gravity were “turned off?”
a) We would spiral slowly outward from the sun.
b) We would continue to move in our orbit, but at a decreasing speed.
c) We would spiral rapidly into the sun.
d) We would move directly away from the sun at a decreasing speed.
e) We would move in a straight line at a steady speed.

Answer: _____ 99

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The light collecting ability of a telescope is measured by the two-dimensional area of the lens or mirror. How many 10-inch diameter mirrors would be required to collect the same amount of light as a single 30-inch mirror?
a) 3
b) 9
c) 20
d) 27
e) 300

Answer: _____ 100

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
A planet's ability to retain an atmosphere depends on the average speed of the molecules compared to the speed required to escape from the planet's gravity. Which case below would be most favorable for holding on to atmospheric gases?
a) Heavier molecules at low temperature
b) Heavier molecules at high temperature
c) Lighter molecules at high temperature
d) Lighter molecules at low temperature
e) None of these – molecular speeds don't depend on mass and temperature

Answer: _____ 101

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Compression and composition would be the factors most relevant to understanding which property of a planet?
a) Rotation rate
b) Age
c) Density
d) Ring system
e) Reflectivity

Answer: _____ 102

Lab Game

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Comets occasionally appear in our sky, slowly changing position from night to night as they rise and set with the stars. On the other hand, comet debris is sometimes seen as a meteor shower in which individual meteors move across the sky in a second. Why the difference in the rate of motion?
a) The comet is slowed by friction with the earth's atmosphere.
b) The comet is much hotter.
c) The meteor has a higher density.
d) The meteor is closer
e) The comet is larger.

Answer: _____ 103

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Suppose an irregularly shaped asteroid appears as only an unresolved point of light in your telescope. What might you observe to learn the rate at which it is spinning on its axis?
a) Variations in brightness
b) X-ray emissions
c) Gravitational pull on neighboring asteroids
d) Bending of background starlight
e) Its changing position against the background of stars.

Answer: _____ 104

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: Observers at all locations on Earth observe the same constellations.

Answer: _____ 105

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Diurnal motions are the apparent movement of celestial objects caused by
a) Earth's rotation.
b) Earth's revolution around the Sun.
c) the Moon's tidal forces.
d) Earth's motion around the Galaxy.

Answer: _____ 106

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
If the time in Atlanta is 10:00 am Eastern Standard Time, then the standard time in Austin, Texas, is ___ Central Standard Time.
a) 10 am
b) 12 noon
c) 11 am
d) 9 am

Answer: _____ 107

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: When you cross the International Date Line on a trip from Los Angeles to Tokyo, you add a day to your calendar.

Answer: _____ 108

Lab Game

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The apparent path of the Sun in the sky is called the
a) North Celestial Pole
b) South Celestial Pole
c) Celestial Equator
d) Ecliptic

Answer: _____ 109

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: Lunar eclipses do not occur every month because the Moon's orbit is inclined to the plane of Earth's orbit around the Sun.

Answer: _____ 112

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Suppose the date is March 21 and the Sun passes through your zenith at noon. Where are you?
a) The equator
b) the Tropic of Cancer
c) the Antarctic Circle
d) the Arctic Circle
e) the Tropic of Capricorn

Answer: _____ 110

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
A week after full moon, the Moon's phase is
a) first quarter
b) new
c) third quarter
d) waxing crescent

Answer: _____ 113

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Why do we have seasons on Earth?
a) The tilt of the Earth's axis constantly changes between 0 and 23.5°, giving us summer when the Earth is tilted more and winter when it is straight up.
b) The Earth's distance from the Sun varies, so that it is summer when we are closer to the Sun and winter when we are farther from the Sun.
c) As the Earth goes around the Sun and the Earth's axis remains pointed toward Polaris, the Northern and Southern hemispheres alternately receive more and less direct sunlight.
d) Seasons are caused by the influence of the planet Jupiter on our orbit.

Answer: _____ 111

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
How did Eratosthenes estimate the size of the Earth in 240 B.C.?
a) By measuring the size of the earth's shadow on the Moon in a lunar eclipse
b) by comparing the maximum altitude of the Sun in two cities at different latitudes
c) by sending fleets of ships around the earth
d) by observing the duration of a solar eclipse
e) We don't know how he did it since all his writings were destroyed

Answer: _____ 114

Lab Game

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Tycho Brahe's contribution to astronomy included:
a) inventing the telescope.
b) proving the Earth circles the Sun.
c) collecting data that enabled Kepler to discover the laws of planetary motion.

Answer: _____ 115

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Kepler's First Law of planetary motion states that planets move in ellipses with the Sun at one focus. What lies at the other focus?
a) Another planet
b) A comet
c) A planetary satellite (moon)
d) Nothing

Answer: _____ 116

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
A planet is physically closest to the Sun at
a) aphelion
b) June 21st
c) perihelion
d) opposition

Answer: _____ 117

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: According to Kepler's 2nd Law, Earth moves slower when closer to the Sun.

Answer: _____ 118

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
If you know a star's declination, you can determine your latitude if you also
a) measure its altitude when it crosses the meridian
b) measure its right ascension
c) know the universal time

Answer: _____ 119

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: The term "velocity" describes both speed and direction.

Answer: _____ 120

Lab Game

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: Newton's 2nd Law of Motion states that an object will be accelerated by an amount equal to force divided by mass

Answer: _____ 121

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Which person is weightless?
a) A child in the air as she plays on a trampoline.
b) A submarine captain exploring a deep-sea wreck.
c) An astronaut on the Moon.

Answer: _____ 122

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The apparent retrograde motion of the outer planets is caused by
a) the gravitational influence of Jupiter
b) a reversal of actual planetary motion
c) Earth's overtaking (passing) of the outer planet
d) motion in highly elliptical orbits

Answer: _____ 123

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The force of gravity between two objects depends on their masses and
a) separation
b) speeds
c) composition
d) age

Answer: _____ 124

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Atoms consist of negatively charged electrons and positively charged ____.
a) neutrons
b) photons
c) gamma-rays
d) protons

Answer: _____ 125

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The lightest kind of atom is
a) hydrogen
b) helium
c) oxygen
d) iron

Answer: _____ 126

Lab Game

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The most abundant kind of atom in the Universe is
a) hydrogen
b) helium
c) oxygen
d) iron

Answer: _____ 127

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: Red light has a longer wavelength than blue light.

Answer: _____ 130

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: The color or wavelength of the emitted photon depends on the energy difference between the beginning and ending orbital energies

Answer: _____ 128

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
From smallest to largest energy, the following are ordered:
a) infrared, radio, ultraviolet, X-ray
b) radio, infrared, ultraviolet, X-ray
c) X-ray, ultraviolet, radio, infrared
d) ultraviolet, radio, infrared, X-ray

Answer: _____ 131

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The Sun's spectrum appears as a _____ spectrum.
a) continuous
b) emission
c) absorption
d) Kirchhoff

Answer: _____ 129

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The wavelength corresponding to the peak of the color distribution of a blackbody or Planck curve depends on the object's
a) temperature
b) density
c) magnetic field
d) composition

Answer: _____ 132

Lab Game

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: The largest telescopes in the world are the reflecting (mirror) type.

Answer: _____ 133

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: Binoculars are an example of a reflecting telescope

Answer: _____ 136

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: The CHARA Array is a multiple telescope array designed to achieve high angular resolution.

Answer: _____ 134

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: Stars appear steady and do not twinkle in outer space

Answer: _____ 137

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Which of the following is NOT important in selecting a site for an observatory?
a) Number of clear nights per year
b) steadiness of the atmosphere overhead
c) large distance from the closest city
d) longitude

Answer: _____ 135

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: All of the planets rotate (spin) in the same direction as they orbit.

Answer: _____ 138

Lab Game

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Most planets in the Solar System are observed close to the ecliptic because
a) planets generally orbit in a common plane
b) planets are seen overhead at Earth's equator
c) planets are always seen close to the Sun
d) planets are held by the Sun's magnetism

Answer: _____ 139

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The solar nebula was 98% _____.
a) rock and metal.
b) hydrogen compounds.
c) hydrogen and helium.

Answer: _____ 142

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Between the orbits of Mars and Jupiter we find
a) comets
b) asteroids
c) meteoroids
d) icy moons

Answer: _____ 140

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The Jovian planets were able to capture and hold large gaseous envelopes because of their large
a) magnetic fields
b) spin rates
c) number of moons
d) gravity

Answer: _____ 143

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: All the Jovian planets have orbiting ring systems.

Answer: _____ 141

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
What is meant by the solar nebula?
a) gas ejected from the Sun which fills the inner Solar System
b) a cloud of gas around the outer edges of the Solar System
c) another name for the Sun's outer atmosphere.
d) a disk of gas and dust from which the Sun and planets formed

Answer: _____ 144

Lab Game

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
What was the frost line of the solar system?
a) the distance from the Sun where temperatures were low enough for hydrogen compounds to condense into ices, between the present-day orbits of Mars and Jupiter
b) the distance from the Sun where temperatures were low enough for metals to condense, between the Sun and the present-day orbit of Mercury
c) the distance from the Sun where temperatures were low enough for hydrogen and helium to condense, between the present-day orbits of Jupiter and Saturn
d) the distance from the Sun where temperatures were low enough for rocks to condense, between the present-day orbits of Mercury and Venus

Answer: _____ 145

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: Most of the mass of the Solar System is contained in the Sun.

Answer: _____ 146

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
About how old is the solar system?
a) 4.5 million years
b) 4.5 billion years
c) 4.5 trillion years

Answer: _____ 147

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: Interior differentiation refers to the sinking of light elements and the rising of heavier elements.

Answer: _____ 148

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The present widening of the Atlantic Ocean is caused by
a) gravitational forces exerted by the Moon
b) the Earth expanding as its core material enlarges as a result of heat loss
c) the tidal force on the Earth exerted by the Sun
d) plate tectonic motions associated with convection in Earth's interior

Answer: _____ 149

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The Moon was probably formed when
a) it was captured from Venus early in the history of the Solar System
b) it condensed from ices in the Earth's early atmosphere
c) matter was blasted out of the Earth by the impact of a Mars-size planet

Answer: _____ 150

Lab Game

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Most lunar craters were formed by
a) impact of solid bodies that blasted holes in the Moon's crust
b) volcanic eruptions triggered by eclipses
c) plate tectonic motions that caused the surface to collapse in round holes

Answer: _____ 151

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: Temperatures are more extreme on the Moon because it lacks an atmosphere

Answer: _____ 154

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: The larger the number of craters, the older the surface region

Answer: _____ 152

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The hot surface temperature on Venus is due to atmospheric
a) nitrogen
b) carbon dioxide
c) oxygen
d) hydrogen

Answer: _____ 155

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The Moon's gravitational pull on Earth causes ____ high tides each day.
a) 1
b) 2
c) 3
d) 4

Answer: _____ 153

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The Magellan spacecraft used ____ to map the surface of Venus.
a) seismic waves
b) radar
c) an optical telescope
d) an X-ray telescope

Answer: _____ 156

Lab Game

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
What is the primary ingredient in Earth's atmosphere?
a) Oxygen
b) Nitrogen
c) Hydrogen
d) Carbon Dioxide

Answer: _____ 157

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Comet Shoemaker-Levy 9 ended its life in July, 1994 in a collision with
a) Jupiter
b) Saturn
c) Uranus
d) Neptune

Answer: _____ 160

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The warming of the Earth by the Greenhouse Effect is caused by
a) dust in the atmosphere
b) atmospheric water and carbon dioxide
c) ozone depletion
d) photosynthesis in plants

Answer: _____ 158

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Jupiter's Great Red Spot is a
a) volcano reaching above the cloud tops
b) hurricane
c) band across the planet
d) stationary (motionless) cloud formation

Answer: _____ 161

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The chemical composition of the gas giants is mainly
a) oxygen, nitrogen
b) carbon dioxide
c) sulfuric acid, nitrogen
d) hydrogen, helium

Answer: _____ 159

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: Jupiter has the largest mass and volume of the planets.

Answer: _____ 162

Lab Game

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: Jupiter's Io is the most volcanically active place in the Solar System.

Answer: _____ 163

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: Meteor showers are related to comets rather than asteroids.

Answer: _____ 166

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: Saturn's ring system is made of a solid sheet of rock

Answer: _____ 164

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The material in the asteroid belt represents
a) debris from a planet that exploded
b) debris from the Earth-Moon collision
c) a planet that never formed because of the tidal forces of Jupiter

Answer: _____ 167

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Pluto's mass and radius are now known thanks to the discovery of its
a) ring system
b) moon (Charon)
c) volcanic activity
d) magnetic field

Answer: _____ 165

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: Pluto is now considered to be a Kuiper Belt Object

Answer: _____ 168

Lab Game

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Astronomers call the distant halo of cometary objects the

- a) Kuiper Belt
- b) Solar Nebula
- c) Oort Cloud
- d) Solar System

Answer: _____ 169

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The recently discovered planets around other stars are most like

- a) the Moon
- b) Earth
- c) Pluto
- d) Jupiter

Answer: _____ 172

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Kirkwood gaps (distances from the Sun where there are few asteroids) are caused by the gravitational influence of

- a) Earth
- b) Mars
- c) Jupiter
- d) the Sun

Answer: _____ 170

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Planets were discovered around other stars by measuring their

- a) reflected light
- b) gravitational tug on the star
- c) magnetic fields
- d) radio emission

Answer: _____ 173

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: Planets around other stars are hard to detect mainly because of the intense glare of the star.

Answer: _____ 171

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Astronomers can detect planets around distant stars by looking for changes in the star's brightness as a planet crosses in front, known as a

- a) opposition
- b) mirage
- c) transit
- d) lunar eclipse

Answer: _____ 174

Lab Game

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
What method could detect a planet in an orbit that is face-on to the Earth (zero inclination)?

a) Doppler method
b) Astrometry method

Answer: _____ 175

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: Astronomers recently made direct images of planets around other stars

Answer: _____ 176

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
What's the best explanation for "hot Jupiters"?

a) They formed closer to their stars than Jupiter did.
b) They formed farther out (like Jupiter) and then migrated inwards.
c) The stars' stronger gravity pulled them in closer

Answer: _____ 177

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: The Earth's moon is the only moon to have a thick atmosphere.

Answer: _____ 178

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: Mars has more dramatic seasonal changes than Earth because its orbit is more elliptical than Earth's.

Answer: _____ 179

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: The polar caps on Mars are mostly frozen methane.

Answer: _____ 180

Lab Game

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: The majority of small moons orbiting the Jovian planets are captured asteroids.

Answer: _____ 181

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: When we see a region of a planet that is not as heavily cratered as the other regions, we conclude that the less cratered region must be younger than the other regions.

Answer: _____ 184

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: The primary reason that Mar's interior cooled off faster than the Earth's interior is the Mars is further from the Sun than Earth.

Answer: _____ 182

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: The densest interior layer at the center of a terrestrial planet is called the mantle.

Answer: _____ 185

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: The sky is blue because it is reflecting light from the blue oceans.

Answer: _____ 183

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: A dramatic increase in the amount of carbon dioxide within the lithosphere of a planet would cause a runaway greenhouse effect

Answer: _____ 186

Lab Game

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: Water vapor is responsible for the blue color of Uranus and Neptune.

Answer: _____ 187

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: The Jovian planets have a much higher average density than the terrestrial planets.

Answer: _____ 190

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: Olympus Mons is a huge volcano on Mars.

Answer: _____ 188

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: Magnetic fields are caused by moving charged particles.

Answer: _____ 191

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: The lunar highlands were created billions of years after the heavy bombardment period.

Answer: _____ 189

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: The gradual disappearance of a crater rim as a result of wind and rain is an example of tectonic activity.

Answer: _____ 192

Lab Game

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
TRUE or FALSE: The lunar maria are the result of gradual erosion by micrometeorites striking the Moon.

Answer: _____ 193

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The Earth's atmosphere mostly consists of

- a) hydrogen and helium.
- b) water vapor and carbon dioxide.
- c) oxygen and carbon dioxide.
- d) oxygen and nitrogen.

Answer: _____ 196

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The dominant cause of internal heating and volcanic activity on Io is

- a) radioactive decay
- b) seismic activity
- c) the greenhouse effect
- d) tidal forces

Answer: _____ 194

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The reason that Mars has more wind and weather than Venus is because

- a) it's closer to the sun.
- b) it has a thicker atmosphere.
- c) it's more rapidly rotating.
- d) it's interior is still molten

Answer: _____ 197

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
All of the following have played a role in heating the Earth's interior except for

- a) differentiation
- b) accretion
- c) outgassing
- d) radioactive decay

Answer: _____ 195

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
All of the following have played an important role in shaping the surface of the Earth except for

- a) the aurora
- b) erosion
- c) volcanism
- d) tectonics

Answer: _____ 198

Lab Game

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
What is the name for the process that describes the separation by density of material inside a planet?

a) volcanism.
b) erosion.
c) outgassing.
d) differentiation.

Answer: _____ 199

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Sunsets are red because

a) sunlight must pass through more atmosphere then, and the atmosphere scatters more light at red wavelengths than bluer wavelengths
b) sunlight must pass through more atmosphere then, and the atmosphere scatters more light at blue wavelengths, transmitting mostly red light
c) the Sun emits more red light when it's setting
d) the cooler atmosphere in the evening absorbs more blue light

Answer: _____ 202

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Much of what we know about the Earth's interior has come from studies of

a) tides
b) earthquakes
c) exploring deep man-made wells that extend into the mantle
d) probes sent to the center of the Earth

Answer: _____ 200

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The reason that air pressure is less at high elevations than at sea level is that

a) there is less air above you
b) the air is colder
c) the air is hotter
d) the air at high elevations consists of less massive molecules

Answer: _____ 203

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The Hawaiian Islands formed from

a) a large meteor impact
b) a lot of hard work; they are man made
c) the collision of two tectonic plates
d) a volcanic hot spot

Answer: _____ 201

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Which of the following is believed to be the dominant cause of the 'global warming' that has occurred on the Earth over the last few decades?

a) A slight change in Earth's axis of rotation
b) a slight change in Earth's average distance from the sun
c) the decreased reflectivity of Earth's melting polar caps
d) an increase in the amount of carbon dioxide in the atmosphere

Answer: _____ 204

Lab Game

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Where do the high-energy particles that strike the Earth's atmosphere and cause the northern and southern aurora come from?
a) The sun
b) the moon
c) outgassing from volcanoes
d) radioactive decay

Answer: _____ 205

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Why do the Jovian planets bulge around the equator, that is, have a "squashed" appearance?
a) Their rapid rotation flings the mass near the equator outward.
b) They are much more massive than the terrestrial planets.
c) Their large moons gravitationally attract the mass around the equator more.
d) Their internal heat sources exert a pressure against the side of the planet.

Answer: _____ 208

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
One property that makes Neptune and Uranus different from Jupiter and Saturn is that Uranus and Neptune
a) have more water, methane, and ammonia (hydrogen compounds).
b) Are closer to the sun
c) are larger
d) are gas giants

Answer: _____ 206

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The planet whose surface most closely resembles the surface of Earth's moon is
a) Mars
b) Venus
c) Mercury
d) Jupiter

Answer: _____ 209

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
What feature of the Earth protects its atmosphere from the 'sand-blasting' effect of the solar wind?
a) Its ozone layer
b) its carbon dioxide rich atmosphere
c) its magnetic field
d) its moon

Answer: _____ 207

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The majority of oxygen in the Earth's atmosphere comes from
a) plants
b) meteor impacts
c) volcanic outgassing
d) the solar wind

Answer: _____ 210

Lab Game

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Knowing that the Sun and the Moon “look” about the same size in the sky (i.e. they subtend the same angle), what other piece of information do we need to determine the relative sizes of the Sun and Moon?
a) the size of Earth’s shadow on the Moon
b) the relative sizes of Earth and the Moon
c) the number of times farther away the Sun is than the Moon
d) the size that Earth would appear if viewed from the Moon

Answer: _____ 211

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
How did the Pythagorean model of the stellar sphere account for the different paths the Sun takes across the sky in summer and winter?
a) The rotation rate of the stellar sphere changed seasonally
b) The direction of rotation for the stellar sphere reversed from summer to winter
c) The direction of the stellar sphere’s axis of rotation changed throughout the year
d) The Sun’s position on the stellar sphere changed throughout the year

Answer: _____ 214

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
How much time is there between when a star rises and when it sets?
a) less than twelve hours
b) about twelve hours
c) more than twelve hours
d) it depends on the star

Answer: _____ 212

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
You observe a star rising directly to the east. When this star reaches its highest position above the horizon, where will it be?
a) high in the northern sky
b) high in the eastern sky
c) high in the southern sky
d) high in the western sky
e) directly overhead

Answer: _____ 215

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The brightest star in the constellation Orion rise at about 10 P.M. One week from now this star will rise at about what time?
a) 9:30 P.M.
b) 10:00 P.M. (i.e. any change will not be noticeable)
c) 10:30 P.M.
d) 10:00 A.M.

Answer: _____ 213

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Star that never appear to set are called circumpolar. As you move from Earth’s equator toward the North Pole, the number of circumpolar stars:
a) increases
b) decreases
c) stays the same

Answer: _____ 216

Lab Game

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
In the celestial sphere model of the sky, the Sun's position is constantly changing; the path that it follows is called the ecliptic. About how long does it take the Sun to complete one trip around the ecliptic?
a) 23 hours 56 minutes
b) 24 hours
c) 27 days
d) 365 days

Answer: _____ 217

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
What is the approximate date when the Sun's path along the ecliptic crosses Earth's equator on its way north?
a) January 3
b) March 21
c) June 21
d) September 22
e) December 21

Answer: _____ 218

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
How often is the Sun directly over Earth's equator?
a) once a day
b) once a month
c) once every six months
d) once a year

Answer: _____ 219

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
If the Sun's motion along the ecliptic were reversed, how would its daily motion appear?
a) it would continue to rise in the east and set in the west
b) it would now rise in the west and set in the east

Answer: _____ 220

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Under the Ptolemaic Model, a planet in retrograde motion, over the course of one night, will move in what direction?
a) east to west
b) west to east
c) not at all, as planets do not move with the stars
d) randomly, as planets move differently than the stars

Answer: _____ 221

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
During retrograde motion, planets rise:
a) in the east each night
b) in the west each night
c) at the same time every night

Answer: _____ 222

Lab Game

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Epicycles are the circular loops that ____ make(s) during an orbit about ____ in the Ptolemaic model of the solar system.
a) distant stars, Earth
b) Earth, the Sun
c) planets other than Earth, Earth
d) planets other than Earth, the Sun

Answer: _____ 223

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Bodies in orbit around the Sun change speeds during different sections of their orbits. Which of Kepler's laws describes this change in speed?
a) I (describes shapes)
b) II (law of equal areas)
c) III (relates period to radius)

Answer: _____ 224

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Copernicus was dissatisfied with the Ptolemaic model because:
a) he could not visualize it
b) he did not believe in the stellar sphere
c) it seemed overly complicated and contrived
d) it did not agree with observations

Answer: _____ 225

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Consider two exoplanets that orbit a distant star. Planet A is closer to the star than Planet B, and in fact, Planet B's semi-major axis is twice as large as Planet A. How does Planet B's orbital period compare with planet A?
a) half as long
b) the same
c) twice as long
d) more than twice as long

Answer: _____ 226

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
Newton introduced the universal law of gravity, and with it was able to explain:
a) all three of Kepler's laws
b) why no one could detect stellar parallax
c) why Mars moved in "retrograde loops" as seen from Earth

Answer: _____ 227

Name : _____ Question Type: Multiple Choice
Question Rating: 1
Possible Cost: 2

Helper: _____

Question:
The time it takes a small body to orbit around a large one depends only on:
a) the mass of the small body
b) the mass of the large body
c) the radius of the orbit
d) a and b
e) b and c

Answer: _____ 228

Lab Game

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2
Helper: _____

Question:
Which pair of planets originally formed at a location that had a temperature above the boiling point of water?
a) Mars and Jupiter
b) Saturn and Jupiter
c) Mercury and Saturn
d) Venus and Jupiter
e) Earth and Mars

Answer: _____ 229

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2
Helper: _____

Question:
The composition of which group of planets best reflects the composition of the nebula out of which the solar system formed?
a) the terrestrial planets
b) the Jovian planets

Answer: _____ 230

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2
Helper: _____

Question:
We believe that the denser planets tend to be located nearer the Sun because:
a) it is predicted by Newton's laws
b) the gravity of the Sun affects them more
c) it was hotter near the Sun when these planets formed
d) angular momentum is a conserved quantity

Answer: _____ 231

Question Type: Multiple Choice
Name : _____ Question Rating: 1
Possible Cost: 2
Helper: _____

Question:
On the day that shadows were known to reach the bottom of a well in Syene, Eratosthenes measured the shadow angle in Alexandria to be 7° from which he concluded that Earth was about 25,000 miles around. If he had made a mistake in his measurement and found the angle to be 5° , Eratosthenes would have calculated what value for the circumference of Earth?
a) less than 25,000 miles
b) greater than 25,000 miles

Answer: _____ 232