

Remaining Time: 1 hour, 54 minutes, 11 seconds.

Question Completion Status:

QUESTION 1

- When the apple plunked Newton on the head, what does legend tell that he realized?
- The Universe is obeys a different set of laws than Earth
  - The Universe obeys the same physical laws as Earth
  - The amount of matter in a substance determines its force
  - That acceleration is the same for all objects no matter their mass

2 points Save Answer

QUESTION 2

- Which of the following has your "address" in the correct order?
- you, Earth, Local Group, Local Supercluster, solar system, Milky Way
  - A. you, Earth, solar system, Local Group, Milky Way, Local Supercluster
  - you, Earth, solar system, Milky Way, Local Group, Local Supercluster
  - you, Earth, solar system, Milky Way, Local Supercluster, Local Group
  - you, Earth, solar system, Local Group, Local Supercluster, Milky Way

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Remaining Time: 1 hour, 54 minutes, 03 seconds.

Question Completion Status:

QUESTION 3

- The vernal equinox is?
- The time each year when the Sun crosses the celestial equator moving from south to north.
  - projection of the Earth's geographic equator on to the sky.
  - The projection of the Earth's geographic equator on to the sky.
  - The Earth's axis of rotation extended through the north/south geographic poles until it intersects the celestial sphere.

2 points

Save Answer

QUESTION 4

Assuming the mass stays constant, which type of energy is directly proportional to the square of the speed of the moving object?

- Gravitational
- Electrical
- magnetic
- potential
- kinetic

2 points

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Remaining Time: 1 hour, 53 minutes, 59 seconds.

Question Completion Status:

**QUESTION 5**

If we survive on this planet for another 11,000 years (seems unlikely at the moment?), which star will our descendants think is the northern polestar?

- Betelgeuse
- Polaris
- Thuban
- Vega
- Rigel

2 points

Save Answer

**QUESTION 6**

If venus orbits earth it would have \_\_\_\_\_ phases but if it orbits the sun it would have \_\_\_\_\_ phases

- 3.8
- 4.8
- 2.7
- 2.8
- no difference in the number of phases

2 points

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Remaining Time: 1 hour, 53 minutes, 53 seconds.

Question Completion Status:

QUESTION 7

During a total lunar eclipse, which of the following are true?

- I. The corona of the sun is obscured by the moon.
- II. The moon is in Earth's umbra.
- III. The moon is new.
- IV. The moon is full.

- I,III
- II,III
- I,IV
- I,II
- II,IV

2 points

Save Answer

QUESTION 8

Which of the following people did not accept a heliocentric model for the universe?

- Kepler
- Copernicus
- Brahe
- Galileo
- Newton

2 points

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Remaining Time: 1 hour, 53 minutes, 50 seconds.

Question Completion Status:

QUESTION 9

In what year did the catholic church exonerate Galileo?

- 1692
- 1792
- 1892
- 1992
- still has not been exonerated

2 points

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QUESTION 10

Kepler's first law of planetary motion implies that

- a planet moves at a constant speed at all points in its orbit.
- the distance that a planet is from the sun depends on the mass of the planet
- uniform circular motion is adequate to describe the motion of all planets.
- the distance between the planet and the sun changes as the planet orbits the sun.
- planets closer to the sun than Earth will show retrograde motion.

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Remaining Time: 1 hour, 53 minutes, 46 seconds.

Question Completion Status:

**QUESTION 11**

The force due to gravity between two objects depends on

- I. the mass of each object.
- II. the distance each object is from Earth.
- III. the distance between the two objects.
- IV. the speed of light.

- I, II
- I, III
- II, V
- I, II, III
- all the above

2 points

Save Answer

**QUESTION 12**

An object has been located orbiting the sun at a distance from the sun of 1 AU, what is the approximate orbital period of this object?

- 1/2 a year
- 2 yrs

2 points

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Remaining Time: 1 hour, 53 minutes, 44 seconds.

Question Completion Status:

**QUESTION 12**

An object has been located orbiting the sun at a distance from the sun of 1 AU, what is the approximate orbital period of this object?

- 1/2 a year
- 2 yrs
- 1 yr
- 3 yrs
- 10 yrs

2 points

Save Answer

**QUESTION 13**

Kepler's second law states that a planet moves fastest when it

- at its most northerly point
- is at conjunction
- is closest to the sun
- is furthest from the sun

2 points

Save Answer

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Remaining Time: 1 hour, 53 minutes, 42 seconds.

Question Completion Status:

**QUESTION 14**

According to Newton's second law of motion,

- an object acted on by a constant force does not move.
- an object acted on by a constant force moves with a constant velocity
- an object acted on by a constant force moves with a constant speed, although the direction may vary.
- an object acted on by a constant force moves with a constant acceleration.

2 points Save Answer

**QUESTION 15**

Compared with your mass on Earth, your mass out in space, among the stars is

- Less than on Earth
- The same as on Earth
- greater than on earth
- The force and therefore the mass depends on which celestial object one is near

2 points Save Answer

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Save All Answers

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Remaining Time: 1 hour, 53 minutes, 38 seconds.

Question Completion Status:

QUESTION 16

According to the universal law of gravitation, if you increase the distance between two objects by a factor of 10, then the gravitational force between them will

- decrease by a factor of 100
- Increase by a factor of 100
- decrease by a factor of 1000
- decrease by a factor of 5
- Increase by a factor of 1000

2 points

Save Answer

QUESTION 17

Which of the following scenarios correctly demonstrates the transformation of mass into energy as given by Einstein's equation,  $E = mc^2$ ?

- A burning piece of wood produces light and heat, therefore giving off radiative and thermal energy
- water behind a dam
- accelerating an object at great speed
- the sun
- rings of saturn

2 points

Save Answer

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Save All Answers

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Remaining Time: 1 hour, 53 minutes, 30 seconds.

Question Completion Status:

**QUESTION 18**

Which of the following statements correctly describes the law of conservation of energy?  
 Energy can change between many different forms, such as potential, kinetic, and thermal, but it is ultimately destroyed.

2 points Save Answer

- An object always has the same amount of energy.
- The total quantity of energy in the universe never changes.
- The fact that you can fuse hydrogen into helium to produce energy means that helium can be turned into hydrogen to produce energy.
- It is not really possible for an object to gain or lose potential energy, because energy cannot be destroyed.

**QUESTION 19**

When a rock is held above the ground, we say it has some potential energy. When we let it go, it falls and we say the potential energy is converted to kinetic energy. Finally, the rock hits the ground. What has happened to the energy?

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Remaining Time: 1 hour, 53 minutes, 28 seconds.

Question Completion Status:

QUESTION 19

When a rock is held above the ground, we say it has some potential energy. When we let it go, it falls and we say the potential energy is converted to kinetic energy. Finally, the rock hits the ground. What has happened to the energy?

- It is transformed back into gravitational potential energy.
- The rock keeps the energy inside it (saving it for later use).
- The rock keeps the energy inside it (saving it for later use).
- The energy goes to producing sound and to heating the ground, rock, and surrounding air.

2 points

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QUESTION 20

In which of the following cases would you feel weightless?

- while walking on the Moon
- while traveling through space in an accelerating rocket
- while falling from an airplane with your parachute open

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Save All Answers

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Remaining Time: 1 hour, 53 minutes, 24 seconds.

Question Completion Status:

QUESTION 20

In which of the following cases would you feel weightless?

- while walking on the Moon
- while traveling through space in an accelerating rocket
- while falling from an airplane with your parachute open
- while falling from a roof
- None of the above

2 points

Save Answer

QUESTION 21

Kepler's third law,  $p^2 = a^3$ , means that

- planets that are farther from the Sun move at slower average speeds than nearer planets.
- the period of a planet does not depend on its mass.
- all orbits with the same radius have the same period.
- All of the above are correct

2 points

Save Answer

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Save All Answers

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Remaining Time: 1 hour, 53 minutes, 21 seconds.

Question Completion Status:

**QUESTION 22**

When a spinning ice skater pulls in his arms, he spins faster because

- there is less friction with the air.
- there is less friction with the ice.
- there exists an unbalanced reaction force
- angular momentum is conserved.

2 points Save Answer

**QUESTION 23**

The best explanation as to why the earth maintains a constant orbital period despite travelling faster near the sun is:

- Kinetic energy = potential energy
- gravitational energy = kinetic energy
- all the forces acting on the earth have a net = 0
- conservation of angular momentum

2 points Save Answer

**QUESTION 24**

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Save All Answers

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Remaining Time: 1 hour, 53 minutes, 18 seconds.

Question Completion Status:

QUESTION 24

The moon rotates exactly \_\_\_\_\_ time(s) with each orbit around earth

- 1
- 2
- 3
- 4
- 5

2 points

Save Answer

QUESTION 25

The temperature in low earth orbit is actually quite high yet astronauts get cold because?

- it's so windy
- they are moving so fast
- the density of air is much less
- the chemical composition of the air is different

2 points

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