Gravitational Force Quiz Answer Key PDF

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Who formulated the law of universal gravitation?

A. Albert Einstein
B. Galileo Galilei
C. Isaac Newton ✓
D. Johannes Kepler

What are the implications of Einstein's theory of general relativity on our understanding of gravity?

A. Gravity is a force between masses
B. Gravity is the curvature of spacetime ✓
C. Gravity affects the passage of time ✓
D. Gravity is independent of mass

What is the formula for calculating gravitational force between two masses?

A. F = ma
B. F = G (m1 * m2) / r^2 ✓
C. F = (k * q1 * q2) / r^2
D. F = (1/2)mv^2

What is the acceleration due to gravity on Earth?

A. 6.67 m/s^2
B. 9.81 m/s^2 ✓
C. 3.00 m/s^2
D. 1.62 m/s^2

What happens to the gravitational force if the distance between two objects is doubled?

A. It doubles
B. It quadruples
C. It halves
D. It becomes one-fourth ✓

Calculate the gravitational force between two 5 kg masses that are 2 meters apart.

Using F = G (m1 * m2) / r^2, the force is approximately 4.17 × 10^-11 N.

What would happen to the gravitational force if the distance between two objects is reduced to half? Explain your reasoning.

The gravitational force would increase by a factor of four because it is inversely proportional to the square of the distance.

Explain how the gravitational force between two objects changes if the mass of one object is tripled.

The gravitational force will triple because it is directly proportional to the product of the masses.

Describe how gravitational force is responsible for the orbits of planets around the sun.

Gravitational force acts as a centripetal force, keeping planets in a stable orbit around the sun by continuously pulling them towards it.

Discuss the significance of the gravitational constant G in the law of universal gravitation.

The gravitational constant G determines the strength of the gravitational force and is essential for calculating the force between two masses.

What are the effects of gravitational force?

A. Causes objects to fall towards Earth ✓
B. Keeps planets in orbit ✓
C. Determines the weight of an object ✓
D. Increases the speed of light

Which of the following is not affected by gravitational force?

A. Planets
B. Light
C. Stars
D. None of the above ✓

What is the approximate value of the gravitational constant G?

A. 9.81 m/s^2
B. 6.674 × 10^-11 Nm^2/kg^2 ✓
C. 3.00 × 10^8 m/s
D. 1.60 × 10^-19 C

According to Newton's law of universal gravitation, which of the following is true?

A. Gravitational force is inversely proportional to the square of the distance ✓
B. Gravitational force is directly proportional to the product of the masses ✓
C. Gravitational force is independent of distance
D. Gravitational force is a constant value

How does Einstein's theory of general relativity differ from Newton's law of universal gravitation in explaining gravity?

Einstein's theory describes gravity as the curvature of spacetime caused by mass, whereas Newton's law describes it as a force between masses.

Which of the following are factors that influence gravitational force?

A. Mass of the objects ✓
B. Distance between the objects ✓
C. Speed of the objects
D. Temperature of the objects

Which statements are true about gravitational fields?

A. They are regions where a mass experiences a force ✓

B. They are stronger closer to the mass creating them ✓
C. They are unaffected by the mass of the object creating them
D. They can be represented by field lines ✓

What does the gravitational force depend on?

A. Only the mass of one object
B. Only the distance between objects
C. Both the masses of the objects and the distance between them ✓
D. Neither mass nor distance

Which of the following best describes weight?

A. Mass
B. Gravitational force acting on an object ✓
C. Volume
D. Density

Which of the following can be considered as applications of gravitational force?

A. Satellite orbits ✓
B. Tides on Earth ✓
C. Formation of galaxies ✓
D. Nuclear fusion