Calculus and the Cosmos

Calculus · Answer Key · 10 Questions

1. Calculus is used to calculate the instantaneous velocity of a planet. Which planet in our solar system has the highest orbital velocity?

A) Mercury
B) Earth
C) Jupiter
D) Neptune

2. To determine the changing surface area of a growing star, one uses derivatives. Which is the largest type of star by physical volume?

A) Red Dwarf
B) Yellow Dwarf
C) Red Supergiant
D) Neutron Star

3. Differential calculus helps calculate the rate of change of an object's position. What is the approximate speed of light in a vacuum?

A) 100,000 km/s
B) 300,000 km/s
C) 500,000 km/s
D) 1,000,000 km/s

4. Calculus allows scientists to calculate the volume of irregular celestial bodies. What is the approximate shape of the Earth?

A) Perfect Sphere
B) Cube
C) Oblate Spheroid
D) Flat Disc

5. Integration is used to find the area under a curve. What force, modeled by calculus, holds the Moon in orbit around the Earth?

A) Magnetism
B) Gravity
C) Friction
D) Static Electricity

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6. The rate of change in the expansion of the universe is measured by a constant. What is the name of this constant?

A) Hubble Constant
B) Newton's Constant
C) Planck Constant
D) Avogadro's Constant

7. Calculus helps determine the trajectory of spacecraft. Which is the most distant human-made object in space?

A) Voyager 1
B) Hubble Telescope
C) International Space Station
D) Mars Rover

8. The mass of a planet can be calculated using its gravitational effect on others, a process requiring calculus. Which is the most massive planet in our solar system?

A) Saturn
B) Earth
C) Jupiter
D) Uranus

9. Calculus is used to model the cooling rate of planets. Which planet is the hottest in our solar system?

A) Mercury
B) Venus
C) Mars
D) Jupiter

10. The slope of a function can represent acceleration. What is the approximate acceleration due to gravity on the surface of the Earth?

A) 4.2 m/s^2
B) 9.8 m/s^2
C) 15.6 m/s^2
D) 22.1 m/s^2

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