

**CENTRIPETAL ACCELERATION AND FORCE
GRAVITATIONAL POTENTIAL ENERGY NOT ON EARTH
QUIZ**

Name: _____

Date: _____

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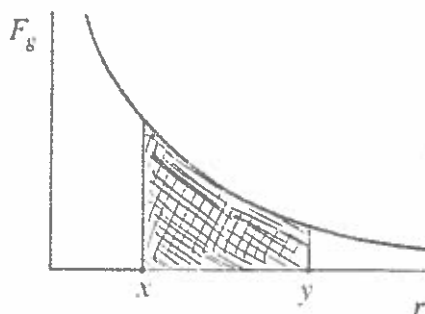
1. Two objects of unequal mass are dropped from the same height near the surface of the earth. Which of the following is the same for both objects just before they hit the surface? (Ignore friction.)
- A. velocity
 - B. net force
 - C. momentum
 - D. kinetic energy
2. What is the gravitational field strength on the surface of a moon with a mass of 3.7×10^{21} kg and a radius of 8.4×10^5 m?
- A. 0.35 N/kg
 - B. 9.8 N/kg
 - C. 540 N/kg
 - D. 2.9×10^5 N/kg
3. What is the speed required to maintain a stable orbit around a planet of mass 2.5×10^{27} kg at a radius (from the centre of the planet) of 8.5×10^7 m?
- A. 23 m/s
 - B. 3.3×10^4 m/s
 - C. 4.4×10^4 m/s
 - D. 9.8×10^8 m/s

4. An aircraft flies in a vertical circular path of radius 2000 m. At the top of this path the 71 kg pilot feels lighter and experiences a 200 N upward force from the seat.



What is the speed of the aircraft?

- A. 75 m/s
 - B. 120 m/s
 - C. 140 m/s
 - D. 160 m/s
5. As an object moves from x to y , the shaded area below the graph of gravitational force versus distance of separation represents

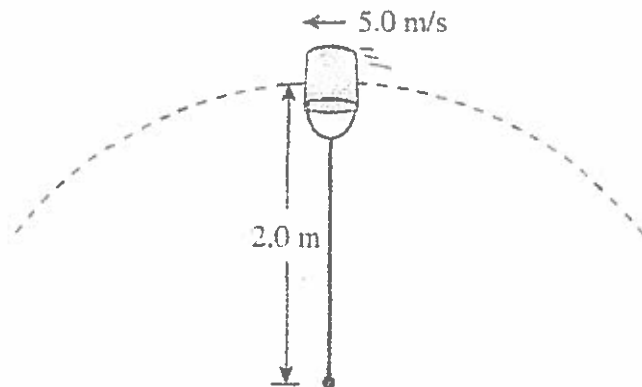


- A. the gain in kinetic energy.
 - B. the energy released into space.
 - C. the work required to move the object.
 - D. the average force required to move the object.
6. A 75 kg astronaut stands on the surface of a planetoid with a mass of 5.8×10^{21} kg and a radius of 7.3×10^5 m. What is the gravitational field strength at the surface?
- A. 0.73 N/kg
 - B. 1.6 N/kg
 - C. 9.8 N/kg
 - D. 54 N/kg

7. What minimum energy is required to raise a 1.7×10^3 kg vehicle from the surface of the Moon to a height of 5.22×10^6 m?

- A. 1.6×10^9 J
- B. 3.6×10^9 J
- C. 4.8×10^9 J
- D. 1.4×10^{10} J

8. A 4.0 kg bucket of paint tied to a rope is being swung in a vertical circle with a radius of 2.0 m. The speed of the bucket at the top of its swing is 5.0 m/s.



What is the tension in the rope at this point?

- A. 11 N
- B. 39 N
- C. 50 N
- D. 89 N

