

CONCEPTUAL PHYSICS ALIVE! VIDEO QUESTION SET

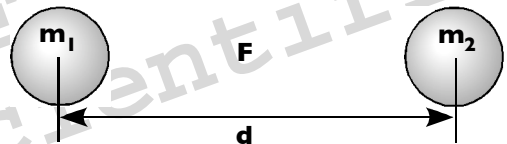
Gravity I

In this lecture, Paul Hewitt focuses on Newton’s law of universal gravitation and how to interpret the corresponding equation. He illustrates the nature of the inverse square law and discusses the physics of weightlessness. Read the following questions before the presentation begins. Answer them while the presentation is in progress. [43 minutes]

1. The pattern that connects objects in the universe can be expressed as a simple mathematical relationship. Write the relationship in the space below.

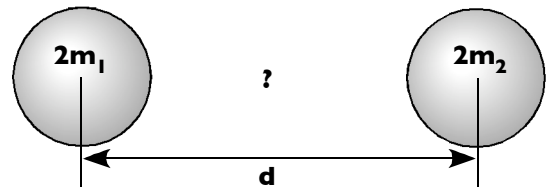
2. Isaac Newton did not discover gravity, but he did discover that gravity was _____.

3. A certain gravitational force F exists between two planets having masses m_1 and m_2 and a distance d between them.

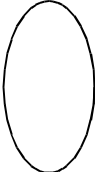
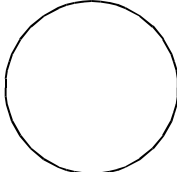
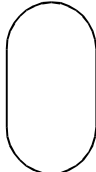
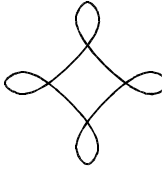


What is the force if both masses are doubled?

- A. one fourth as much
- B. half as much
- C. twice as much
- D. four times as much



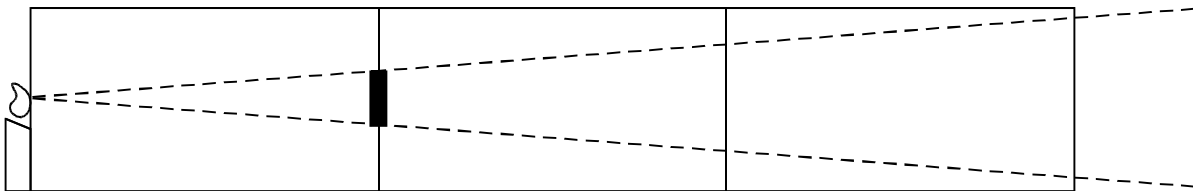
4. Which shape is a typical ellipse?

- A. 
- B. 
- C. 
- D. 

5. Which of these follows an inverse square law?

- A. light intensity
- B. radioactivity
- C. magnetism
- D. electricity
- E. all of these
- F. none of these

6. A blackboard eraser placed a certain distance from a candle casts a shadow.



How many erasers will fit into the space of the shadow at twice the distance from the candle?

- A. 1 B. 2 C. 3 D. 4 E. 6 F. 8 G. 9

7. Take your mass, multiply it by the mass of the world, divide it by the distance between you and the center of the world squared, and you'll get your _____.

8. A person in free fall experiences a sensation that physicists call

- A. true weightlessness. B. gravitational weightlessness.
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9. At what distance from Earth would the Earth's gravitational pull go to zero?

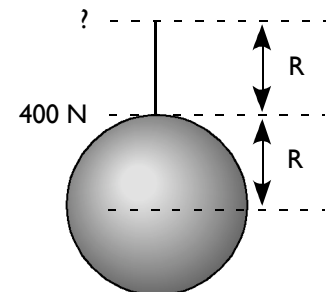
- A. beyond the Earth's atmosphere B. beyond the sun
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10. Your weight at the top of a mountain is different because

- A. the additional mass of the mountain pulls on you.
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11. A girl weighs 400 N at the surface of the Earth.

At the top of a ladder whose height is equal to the radius of the Earth, her weight is _____ N.



12. French and German astronomers used observations of perturbations of Uranus' orbit to

locate _____.

13. The most skilled skaters are those who

- A. never fall down—they demonstrate superior equilibrium and caution.
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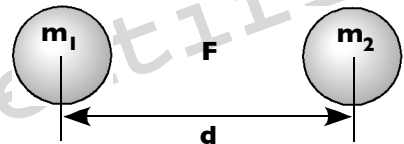
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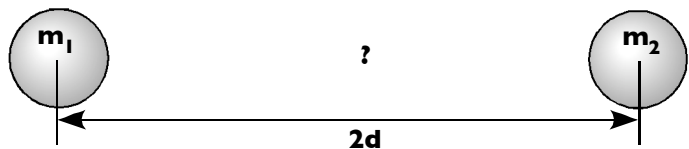
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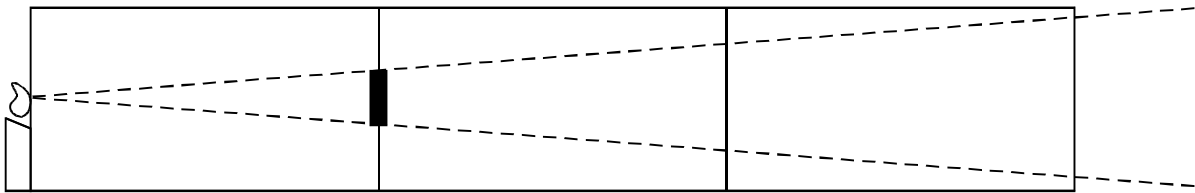
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A. circles. B. ellipses. C. ovals. D. epicycles.

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A. light intensity B. radioactivity C. magnetism
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How many erasers will fit into the space of the shadow at three times the distance from the candle?

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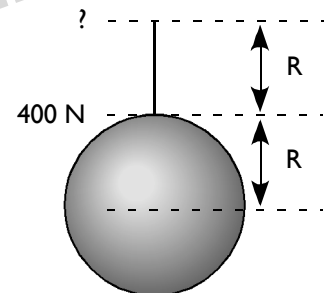
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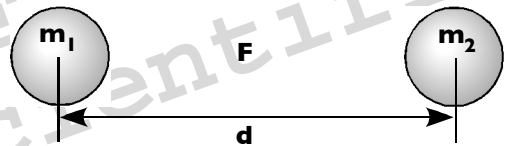
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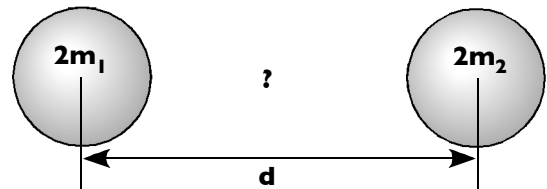
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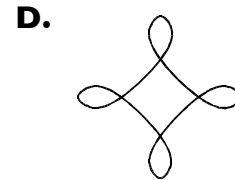
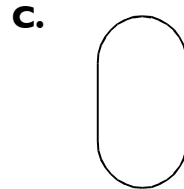
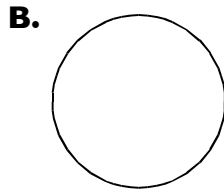
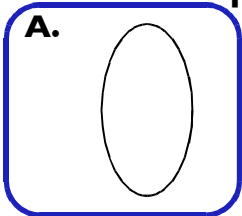


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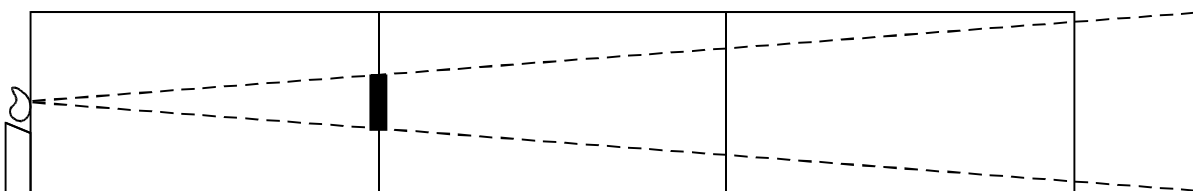
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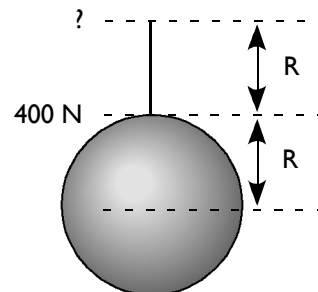
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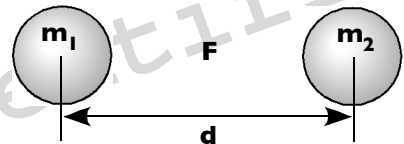
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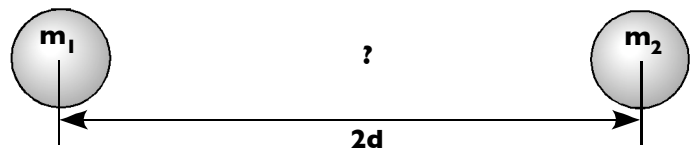
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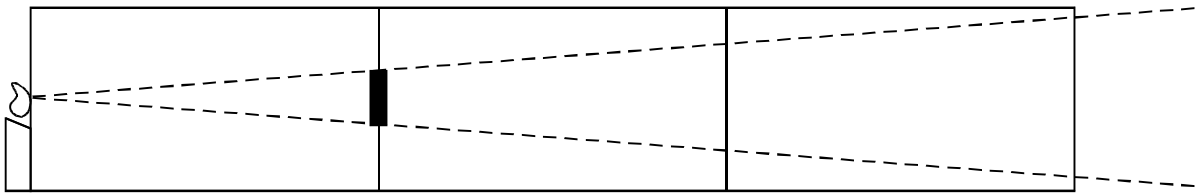
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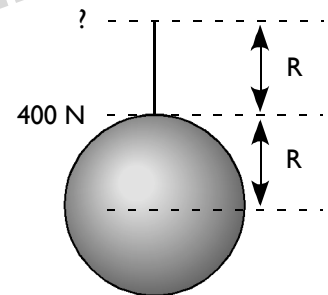
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