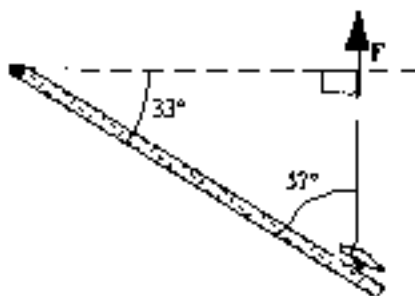
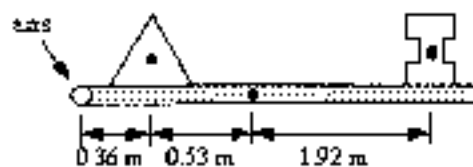


6. A string is tied to a doorknob 0.79 m from the hinge as shown in the figure. At the instant shown, the force applied to the string is 5.0 N. What is the torque on the door?



- A) $3.3 \text{ N}\cdot\text{m}$ B) $2.2 \text{ N}\cdot\text{m}$ C) $1.1 \text{ N}\cdot\text{m}$ D) $0.84 \text{ N}\cdot\text{m}$ E) $0.40 \text{ N}\cdot\text{m}$

7. A 14-kg beam is hinged at one end. A 6.0-kg triangular object and a 7.5-kg I-shaped object are positioned as shown. The dots indicate the individual centers of gravity of the beam and the two objects.



What is the distance from the axis of rotation to the center of gravity for this system?

- A) 1.3 m B) 1.1 m C) 0.96 m D) 0.89 m E) 0.71 m

8. In the produce section of a supermarket, five pears are placed on a spring scale. The placement of the pears stretches the spring and causes the dial to move from zero to a reading of 2.0 kg. If the spring constant is 450 N/m, what is the displacement of the spring due to the weight of the pears?



- A) 0.0044 m B) 0.0088 m C) 0.018 m D) 0.044 m E) 0.088 m

9. When a force of 20.0 N is applied to a spring, it elongates 0.20 m. Determine the period of oscillation of a 4.0-kg object suspended from this spring.

A) 0.6 s B) 1.3 s C) 3.1 s D) 4.1 s E) 6.3 s

10. The density of mercury is $1.36 \times 10^4 \text{ kg/m}^3$. What is the mass of a $4.00 \times 10^{-4}\text{-m}^3$ sample of mercury?

A) 0.0343 kg B) 0.002 94 kg C) 2.94 kg D) 5.44 kg E) 6.29 kg

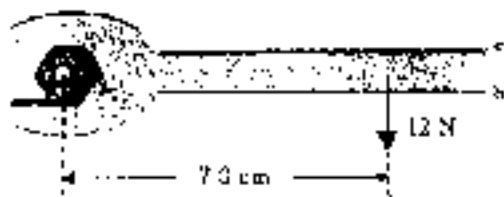
11. What mass of water (at 4.0 °C) can be contained in a rectangular box whose dimensions are 10.0 cm by 5.00 cm by 1.00 cm? The density of water at 4.0 °C is $1.000 \times 10^3 \text{ kg/m}^3$.

A) 5.0 g B) 10.0 g C) 25.0 g D) 50.0 g E) 0.25 kg

12. An airplane engine starts from rest; and 2 seconds later, it is rotating with an angular speed of 300 rev/min. If the angular acceleration is constant, how many revolutions does the propeller undergo during this time?

A) 5 B) 10 C) 50 D) 300 E) 600

13. A wrench is used to tighten a nut as shown in the figure. A 12-N force is applied 7.0 cm from the axis of rotation. What is the torque due to the applied force?



- A) $0.58 \text{ N} \cdot \text{m}$ B) $0.84 \text{ N} \cdot \text{m}$ C) $1.71 \text{ N} \cdot \text{m}$ D) $14 \text{ N} \cdot \text{m}$ E) $58 \text{ N} \cdot \text{m}$

- 6. A
- 7. A
- 8. D
- 9. B
- 10. D
- 11. D
- 12. A
- 13. B