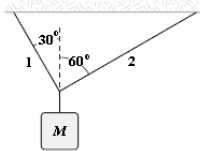


AP Physics C - Unit II Practice

_____ 1. If $M = 6.0$ kg, what is the tension in string 1?



- a. 39 N b. 34 N c. 29 N d. 44 N e. 51 N

_____ 2. The horizontal surface on which the block slides is frictionless. If $F = 20$ N and $M = 5.0$ kg, what is the magnitude of the resulting acceleration of the block?



- a. 5.3 m/s² b. 6.2 m/s² c. 7.5 m/s² d. 4.7 m/s² e. 3.2 m/s²

_____ 3. The tension in a string from which a 4.0-kg object is suspended in an elevator is equal to 44 N. What is the acceleration of the elevator?

- a. 11 m/s² up b. 1.2 m/s² up c. 1.2 m/s² down d. 2.4 m/s² down

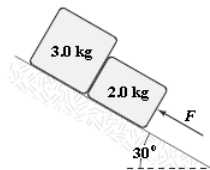
_____ 4. A 2.0-kg block slides on a frictionless 15° inclined plane. A force acting parallel to the incline is applied. The acceleration of the block is 1.5 m/s² down the incline. What is the applied force?

- a. 8.1 N up b. 3.0 N down c. 2.1 N up d. 3.0 N up

_____ 5. The total force needed to drag a box at constant speed across a surface with coefficient of kinetic friction μ_k is least when the force is applied at an angle θ such that

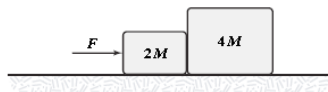
- a. $\sin\theta = \mu_k$. b. $\cos\theta = \mu_k$. c. $\tan\theta = \mu_k$. d. $\cot\theta = \mu_k$.

_____ 6. The surface of the inclined plane shown is frictionless. If $F = 30$ N, what is the magnitude of the force exerted on the 3.0-kg block by the 2.0-kg block?



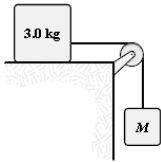
- a. 18 N b. 27 N c. 24 N d. 21 N e. 15 N

_____ 7. The horizontal surface on which the objects slide is frictionless. If $M = 1.0$ kg and the magnitude of the force of the small block on the large block is 5.2 N, determine F .



- a. 6.0 N b. 9.0 N c. 7.8 N d. 4.8 N e. 4.1 N

- _____ 8. The system shown is released from rest and moves 50 cm in 1.0 s. What is the value of M ? All surfaces are frictionless.



- a. 0.42 kg b. 0.34 kg c. 0.50 kg d. 0.59 kg e. 0.68 kg
- _____ 9. A 1.8-kg block is projected up a rough 10° inclined plane. As the block slides up the incline, its acceleration is 3.8 m/s^2 down the incline. What is the magnitude of the friction acting on the block?
- a. 5.0 N b. 3.8 N c. 4.2 N d. 4.6 N e. 6.5 N
- _____ 10. A race car travels 40 m/s around a banked (45° with the horizontal) circular (radius = 0.20 km) track. What is the magnitude of the resultant force on the 80-kg driver of this car?
- a. 0.68 kN b. 0.64 kN c. 0.72 kN d. 0.76 kN e. 0.52 kN
- _____ 11. A car travels along a vertical circle (radius = 0.25 km) at a constant speed of 30 m/s. What is the magnitude of the resultant force on the 60-kg driver at the lowest point on this circular path?
- a. 0.37 kN b. 0.80 kN c. 0.22 kN d. 0.59 kN e. 0.45 kN
- _____ 12. A 4.0-kg mass attached to the end of a string swings in a vertical circle of radius 2.0 m. When the string makes an angle of 35° with the vertical as shown, the speed of the mass is 5.0 m/s. At this instant what is the magnitude of the force the string exerts on the mass?
-
- a. 50 N b. 82 N c. 89 N d. 11 N e. 61 N
- _____ 13. For a plane to be able to fly clockwise in a horizontal circle as seen from above, in addition to exerting a force downwards on the air
- it must be increasing its speed.
 - it must exert a force on the air that is directed to the plane's left side.
 - it must exert a force on the air that is directed to the plane's right side.
 - it does not need to exert a force; it must only move the wing flaps out.
 - it only needs to deflect the air without exerting any additional force on the air.
- _____ 14. An airplane flies in a horizontal circle of radius 500 m at a speed of 150 m/s. If the plane were to fly in a 1 000 m circle at a speed of 300 m/s, by what factor would its centripetal acceleration change?
- a. 0.25 b. 0.50 c. 1.00 d. 2.00 e. 4.00
- _____ 15. If a 20-kg object dropped in air has a terminal speed of 60 m/s, what was its acceleration at 30 m/s?
- a. 9.80 m/s^2 b. 7.35 m/s^2 c. 4.90 m/s^2 d. 2.45 m/s^2

**AP Physics C - Unit II Practice
Answer Section**

MULTIPLE CHOICE

1. E
2. C
3. B
4. C
5. C
6. A
7. C
8. B
9. B
10. B
11. C
12. B
13. B
14. D
15. C