socrative by MasteryConnect

AP Physics 1 - Test 05 - Force and Motion Score: ________

1. A brick slides on a horizontal surface. Which of the following will increase the magnitude of the frictional force on it?

- (A) Putting a second brick on top
- (B) Decreasing the surface area of contact
- (C) Increasing the surface area of contact
- (D) Decreasing the mass of the brick
- (E) None of the above

2. The coefficient of kinetic friction:

- (A) is in the direction of the frictional force
- (B) is in the direction of the normal force
- (C) is the ratio of force to area
- (D) can have units of newtons
- (E) is none of the abovis none of the above

3. When the brakes of an automobile are applied, the road exerts the greatest retarding force:

- (A) While the wheels are sliding
- (B) Just before the wheels start sliding

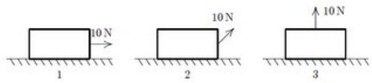
4. A forward horizontal force of 12N is used to pull a 240-N crate at constant velocity across a horizontal floor. The coefficient of friction is:

- (A) 0.5
- (B) 0.05
- (C) 2.0
- (D) 0.2
- (E) 20

5. The speed of a 4.0 N hockey puck, sliding across a level ice surface, decreases at the rate of 0.61 m/s^2. The coefficient of kinetic friction between the puck and ice is: HINT: Find the puck's mass first.

- (A) 0.062
- (B) 0.41
- (C) 0.62
- (D) 1.2
- (E) 9.8

6. A crate rests on a horizontal surface and a woman pulls on it with a 10-N force. No matter what the orientation of the force, the crate does not move. Rank the situations shown below according to the magnitude of the frictional force of the surface on the crate, least to greatest.

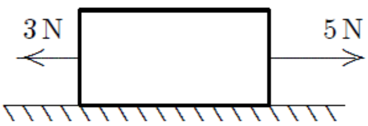


- (A) 1, 2, 3
- (B) 2, 1, 3
- (C) 2, 3, 1
- (D) 1, 3, 2
- (E) 3, 2, 1

7. For <u>linear motion</u> the term "inertia" refers to the same physical concept of

- (A) Weight
- (B) Mass
- (C) Force
- (D) Acceleration
- (E) Volume

8. The block is moving horizontally at a <u>constant velocity</u>. There are two applied forces on the object as shown in the image. In which direction is the friction force acting on the object?



- (A) No friction
- (B) 2 N, leftward
- (C) 2 N, rightward
- (D) 7 N, rightward
- (E) 7 N, leftward

9. In which direction does the acceleration always face?

- (A) In the direction of the Net Force
- (B) In the direction of the greatest applied force
- (C) In the direction of the least applied force
- (D) In the direction opposite of the Net Force
- (E) There is never an accelertion in dynamics applications

10. A ring, seen from above, is pulled on by three forces. The ring is not moving. How big is the force F?

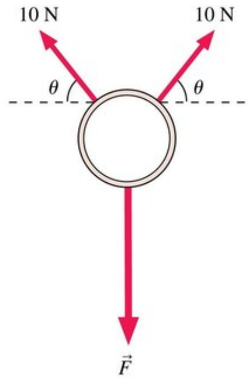
Ⓐ 20 N

Ⓑ $10 \cos\theta$ N

Ⓒ $10 \sin\theta$ N

Ⓓ $20 \cos\theta$ N

Ⓔ $20 \sin\theta$ N



11. The box is sitting on the floor of an elevator. The elevator is accelerating upward. The magnitude of the normal force on the box is

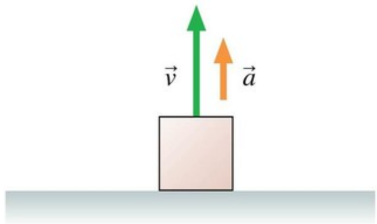
Ⓐ $F_n > mg$

Ⓑ $F_n = mg$

Ⓒ $F_n < mg$

Ⓓ $F_n = 0$

Ⓔ Not enough information to tell



12. A box is being pulled to the right at steady speed by a rope that angles upward. In this situation:

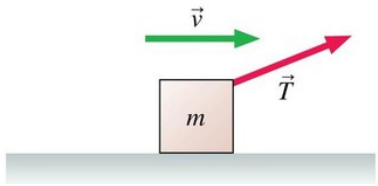
Ⓐ $F_n > mg$

Ⓑ $F_n = mg$

Ⓒ $F_n < mg$

Ⓓ $F_n = 0$

Ⓔ Not enough information



13. Which force do we interpret as our "apparent weight?"

Ⓐ Force of gravity

Ⓑ Normal Force

14. A 50-kg student (mg = 490 N) gets in a 1000-kg elevator at rest and stands on a metric bathroom scale. As the elevator accelerates upward, the scale reads

Ⓐ > 490 N

Ⓑ 490 N

Ⓒ < 490 N

Ⓓ 0 N

15. A 50-kg student (mg = 490 N) gets in a 1000-kg elevator at rest and stands on a metric bathroom scale. Suddenly, the student feels weightless. Should he/she be worried? Why?

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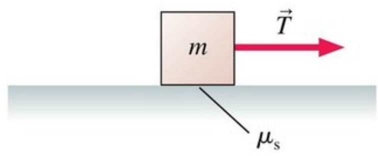
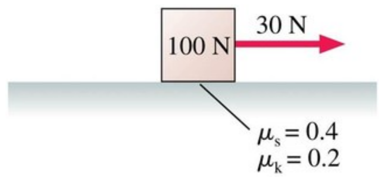
16. A box on a rough surface is pulled by a horizontal rope with tension T. The box is not moving. In this situation:

(A) $f_s > T$
(B) fs = T
(C) fs < T
(D) fs = 0



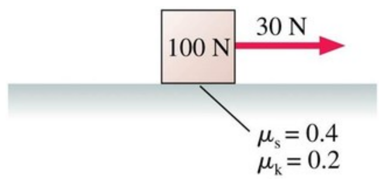
17. A box with a weight of 100 N is ***at rest***. It is then pulled by a 30 N horizontal force. Is this enough force to get it to move?

(A) Yes
(B) No
(C) Not enough infomation



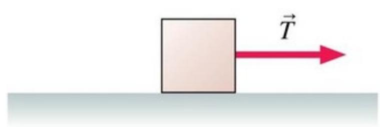
18. A box with a weight of 100 N is ***in motion***. It is then pulled by a 30 N horizontal force. Is this enough force to get it to keep moving?

(A) Yes
(B) No
(C) Not enough information



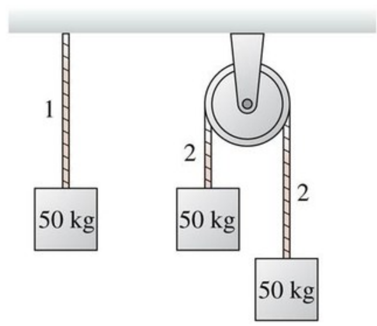
19. A box is being pulled to the right over a rough surface. $F_T > f_k$, so the box is speeding up. Suddenly the rope breaks. What happens to the box ***after*** the rope breaks.

(A) Stops immediately.
(B) Continues with the speed it had when the rope broke.
(C) Continues speeding up for a short while, then slows and stops.
(D) Keeps its speed for a short while, then slows and stops.
(E) Slows steadily until it stops.



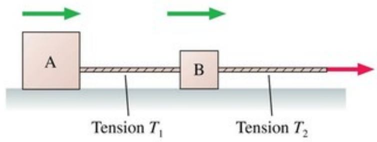
20. All three 50-kg blocks are at rest. The tension in rope 2 is

(A) Greater than the tension in rope 1.
(B) Equal to the tension in rope 1.
(C) Less than the tension in rope 1.



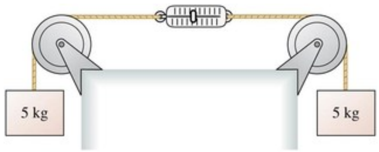
21. Boxes A and B are being pulled to the right on a frictionless surface; the boxes are speeding up. Box A has a larger mass than Box B. How do the two tension forces compare?

Ⓐ $T_1 > T_2$
Ⓑ $T_1 = T_2$
Ⓒ $T_1 < T_2$
Ⓓ Not enough information



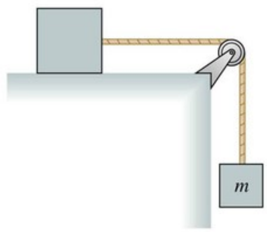
22. The two masses are at rest. The pulleys are frictionless. The scale is in kg. The scale reads

Ⓐ 0 kg
Ⓑ 5 kg
Ⓒ 10 kg



23. The top block is accelerated across a frictionless table by the falling mass m. The string is massless, and the pulley is both massless and frictionless. The tension in the string is

Ⓐ $F_T < mg$
Ⓑ $F_T = mg$
Ⓒ $F_T > mg$



24. A car travels to the right at *constant velocity*. The net force on the car is:

Ⓐ Right
Ⓑ Left
Ⓒ Up
Ⓓ Down
Ⓔ Zero

25. A constant force of 8.0 N is exerted for 4.0 s on a 16-kg object initially at rest. The change in speed of this object will be:

Ⓐ 0.5 m/s

Ⓑ 2 m/s

Ⓒ 4 m/s

Ⓓ 8 m/s

Ⓔ 32 m/s

26. A 400-N block is dragged along a horizontal surface by an applied force F as shown. The coefficient of kinetic friction is μ_k **= 0.4 and the block moves at *constant velocity*. The magnitude of F is:**

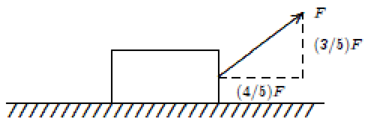
A) 100 N

B) 150 N

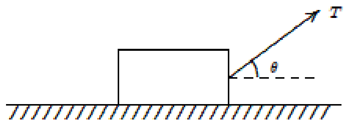
C) 200 N

D) 290 N

E) 400 N



27. A block of mass m is pulled at *__constant velocity__* along a rough horizontal floor by an applied force T as shown. The magnitude of the frictional force is:



A) T cos θ

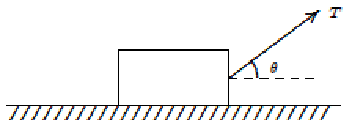
B) T sin θ

C) zero

D) mg

E) mg cos θ

28. A block of mass m is pulled along a rough horizontal floor by an applied force T as shown. The Normal Force acting on the block is:



A) mg

B) mg − T cos θ

C) mg + T cos θ

D) mg − T sin θ

E) mg + T sin θ

29. Why do raindrops fall with constant speed during the later stages of their descent?

A) The gravitational force is the same for all drops

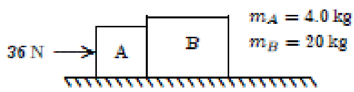
B) Air resistance just balances the force of gravity

C) The drops all fall from the same height

D) The force of gravity is negligible for objects as small as raindrops

E) Gravity cannot increase the speed of a falling object to more than 9.8m/s

30. Two blocks (A and B) are in contact on a horizontal frictionless surface. A 36-N constant force is applied to A as shown. The magnitude of the force of A on B is:



A) 1.5 N

B) 6.0 N

C) 29 N

D) 30 N

E) 36 N