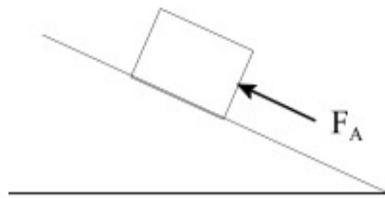


Physics 3204
Unit1- Section 2: Newton's Laws
 Worksheet 1: Review of Physics 2204



1. A box is pushed up a frictionless inclined plane as shown below. Which free body diagram represents this situation?



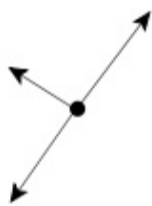
(A)



(B)



(C)

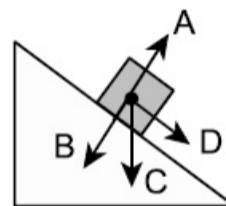


(D)



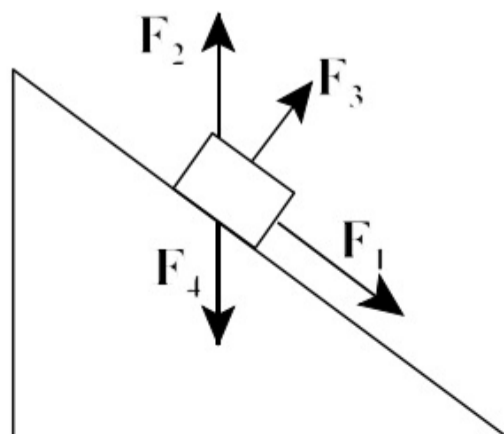
2. The free body diagram below represents an object sliding down a frictionless surface. Which vector represents the force of gravity?

- (A) A
 (B) B
 (C) C
 (D) D



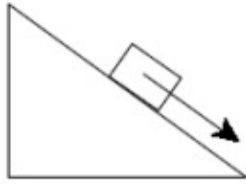
3. The free body diagram below represents an object sliding down a rough incline. Which vector represents the normal force?

- (A) F_1
 (B) F_2
 (C) F_3
 (D) F_4

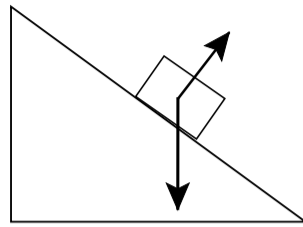


4. Which free body diagram represents a box sliding down an inclined plane with friction?

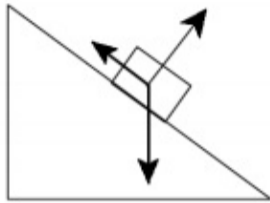
(A)



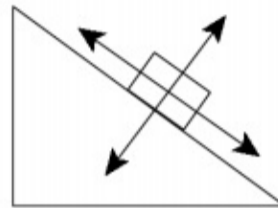
(B)



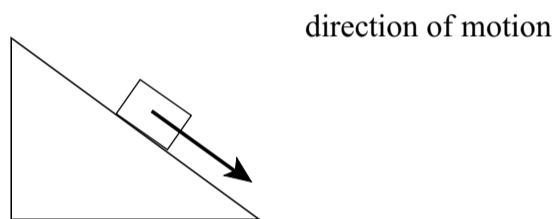
(C)



(D)

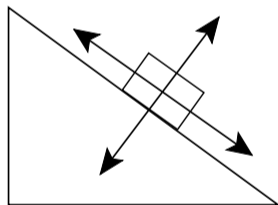


5. In the diagram below, a box is sliding down a frictionless inclined plane.

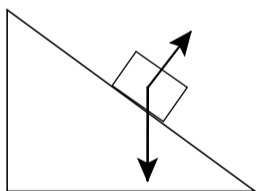


Which free body diagram best represents this situation?

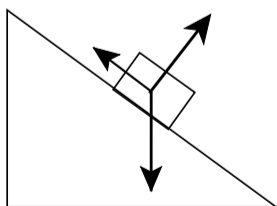
(A)



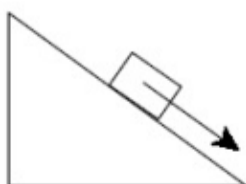
(B)



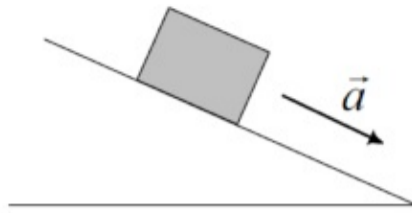
(C)



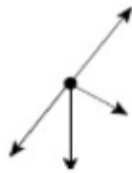
(D)



6. The diagram below shows an object sliding down a frictionless inclined plane at a constant acceleration. Which free body diagram best represents this object?



(A)



(B)



(C)



(D)



7. Which represents the coefficient of kinetic friction for the diagram below?

(A)

$$\frac{F}{F_g}$$

(B)

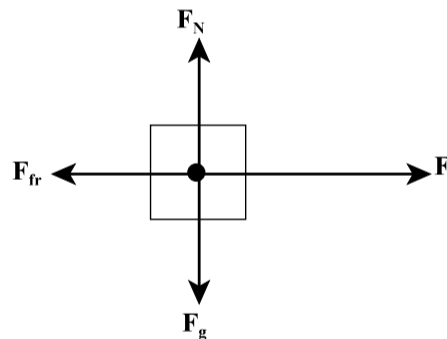
$$\frac{F_{fr}}{F}$$

(C)

$$\frac{F_N}{F_g}$$

(D)

$$\frac{F_{fr}}{F_N}$$



8. What is the frictional force for a 24 kg object on a horizontal surface if $\mu_k = 0.25$?

(A) 6.0 N

(B) 24 N

(C) 59 N

(D) 96 N

9. What is the force of friction on a 10.0 kg object sliding at a constant speed along a horizontal surface if $\mu_k = 0.250$?

(A) 2.50 N

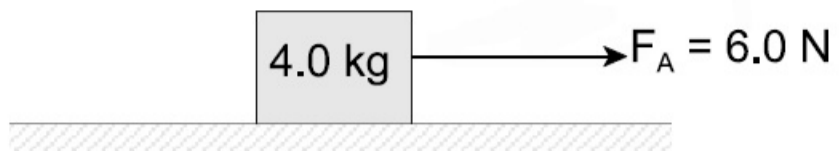
(B) 24.5 N

(C) 97.8 N

(D) 392 N

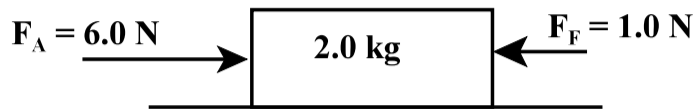
10. What is the magnitude of the acceleration for the object below if $F_f = 1.0 \text{ N}$?

- (A) 0.80 m/s^2
- (B) 1.3 m/s^2
- (C) 1.5 m/s^2
- (D) 1.8 m/s^2



11. What is the magnitude of the acceleration for the object shown below?

- (A) 2.5 m/s^2
- (B) 3.0 m/s^2
- (C) 9.8 m/s^2
- (D) 12 m/s^2

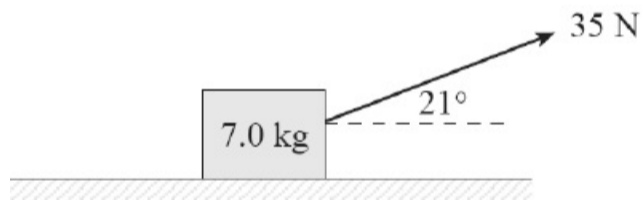


12. A box is pulled on a smooth horizontal floor with a $1.00 \times 10^2 \text{ N}$ force, at 37.0° above the horizontal. If the mass of the box is 40.0 kg , what is the normal force?

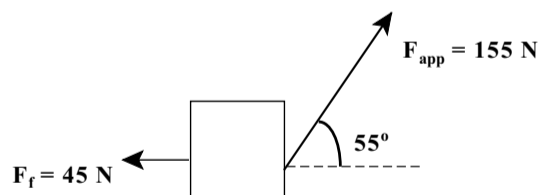
- (A) 292 N
- (B) 312 N
- (C) 332 N
- (D) 393 N

13. In the diagram below, what is the normal force acting on the box?

- (A) 36 N
- (B) 56 N
- (C) 69 N
- (D) 81 N



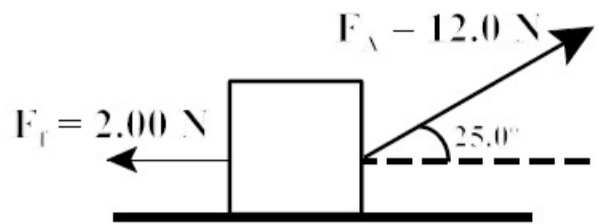
14. What is the magnitude of the net horizontal force acting on the object below?



- (A) 44 N
- (B) 82 N
- (C) $1.1 \times 10^2 \text{ N}$
- (D) $1.3 \times 10^2 \text{ N}$

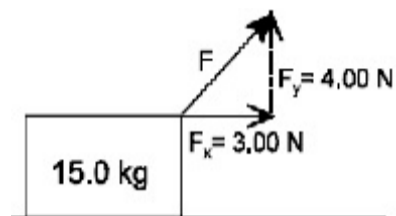
15. What is the net horizontal force acting on the object below?

- (A) 3.07 N
- (B) 8.88 N
- (C) 10.0 N
- (D) 12.0 N



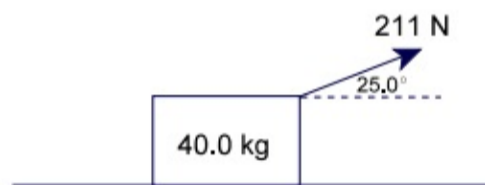
16. A 15.0 kg box is resting on a horizontal surface with an applied force, F , as shown. What is the magnitude of the normal force acting on the box?

- (A) 11 N
- (B) 15 N
- (C) 143 N
- (D) 147 N



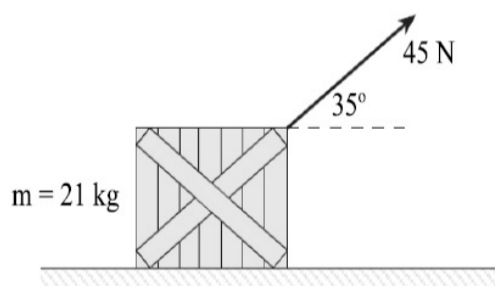
17. What normal force acts on the object shown, when it is pulled to the right on a frictionless surface by a force of 211 N at an angle of 25.0° to the horizontal?

- (A) 201 N
- (B) 303 N
- (C) 392 N
- (D) 481 N



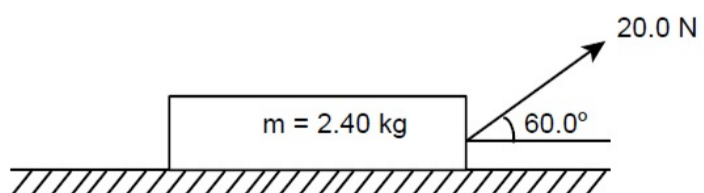
18. If a force of 45 N is applied at a 35° angle above the horizontal to pull a 21 kg crate forward, what is the normal force on the crate?

- (A) 170 N
- (B) 180 N
- (C) 210 N
- (D) 230 N



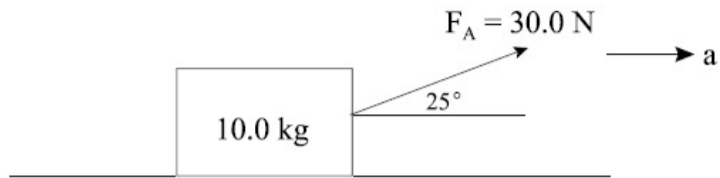
19. What is the normal force in the diagram below?

- (A) 6.20 N
- (B) 10.0 N
- (C) 13.2 N
- (D) 23.5 N

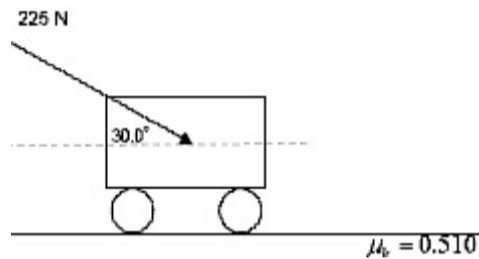


20. What is the magnitude of the acceleration of the object below if the force of friction is 7.0 N?

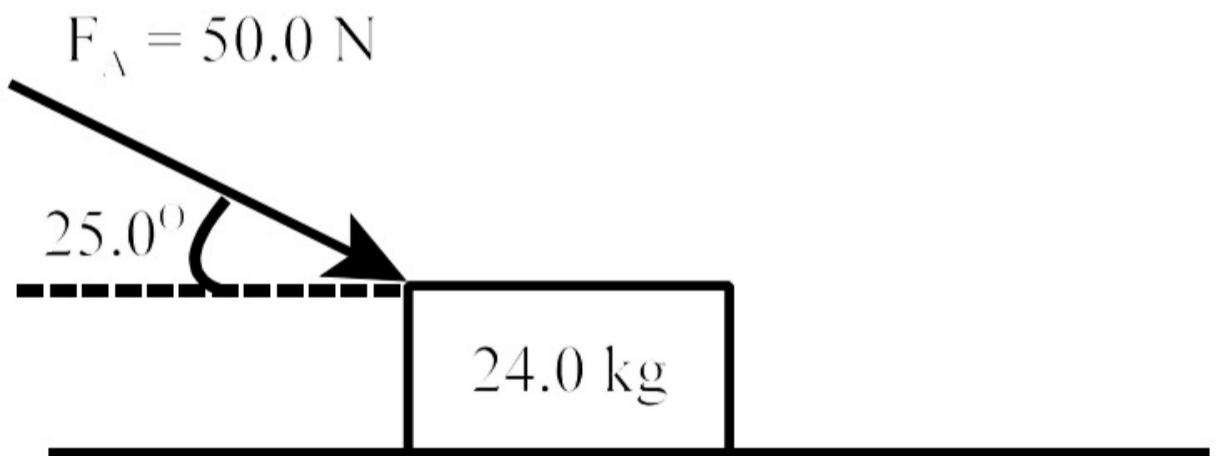
- (A) 0.57 m/s²
 (B) 2.0 m/s²
 (C) 2.3 m/s²
 (D) 2.7 m/s²



22. A 23.5 kg lawn mower is pushed with a force of 225 N as shown ($\mu_k = 0.510$).
AUGUST 2009



- i) Draw a free body diagram for the lawn mower.
- ii) Calculate the magnitude of the acceleration of the lawn mower.
23. In the diagram below, a 24.0 kg box is pushed at a 25.0° angle with an applied force of 50.0 N. The coefficient of kinetic friction is 0.100. **JUNE 2005**



- (i) Draw a free body diagram for the box. Clearly label ALL forces.
- (ii) What is the acceleration of the box?
24. A 5.0 kg block is laid flat on an horizontal table ($\mu_k = 0.10$). The block is pulled to the right with a force of 25 N, at 15° above the horizontal.
- (i) Sketch the free body diagram.
- (ii) What is the magnitude of the acceleration of the block?