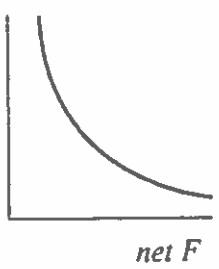
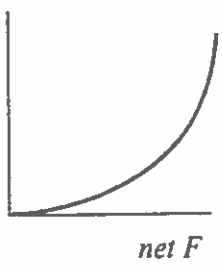
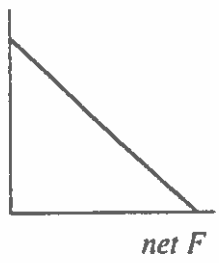
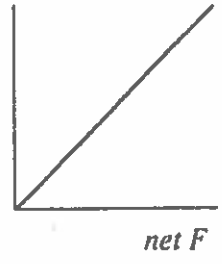
1. Which of the following graphs shows the relationship between acceleration and net force?

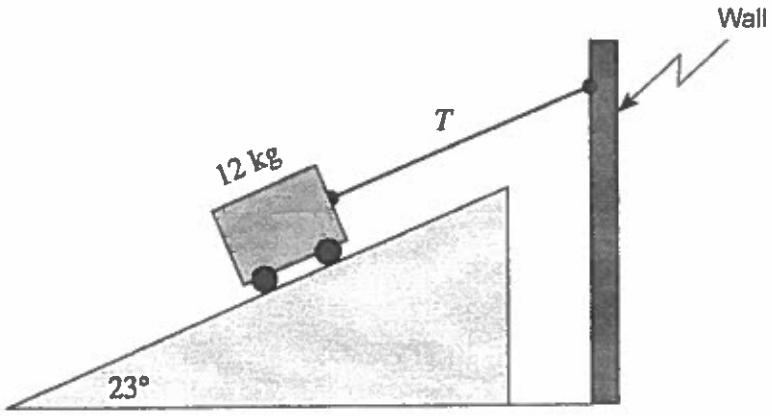
A. 

B. 

C. 

D. 

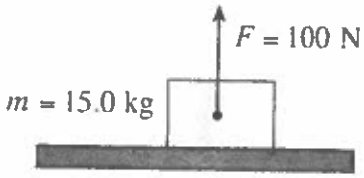
2. A 12 kg cart on a 23° frictionless incline is connected to a wall as shown.



What is the tension T in the cord?

A. 46 N
B. 50 N
C. 110 N
D. 120 N

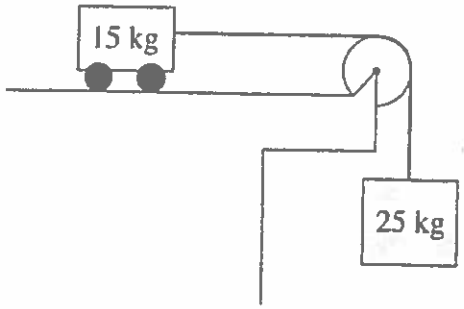
3. A 15 kg block on a horizontal surface has a 100 N force acting on it as shown.



What is the normal force?

A. 47 N
B. 100 N
C. 147 N
D. 247 N

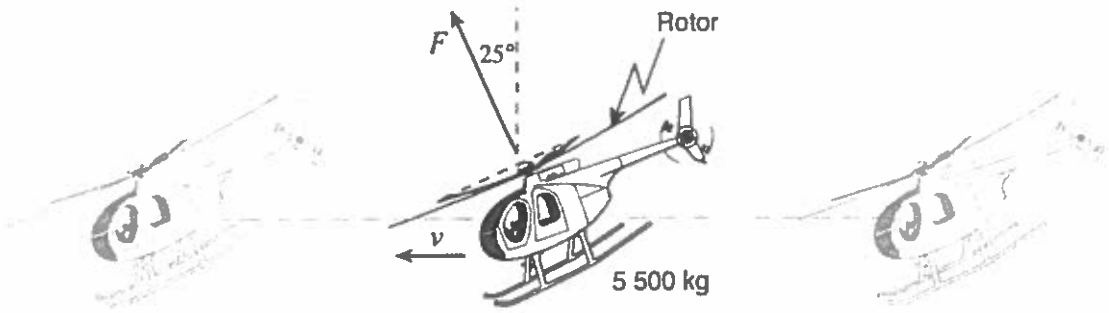
4. A 15 kg cart is attached to a hanging 25 kg mass. Friction is negligible.



What is the acceleration of the 15 kg cart?

A. 2.5 m/s^2
B. 6.1 m/s^2
C. 6.5 m/s^2
D. 16 m/s^2

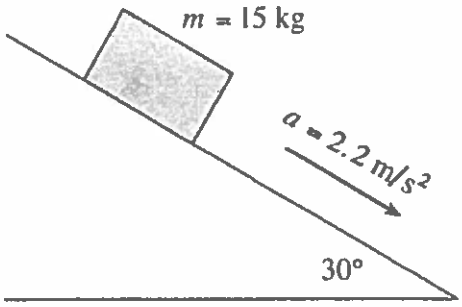
5. A 5 500 kg helicopter is travelling at constant speed in level flight.



What is the force F provided by the rotor?

A. 4.9×10^4 N
B. 5.4×10^4 N
C. 5.9×10^4 N
D. 1.2×10^5 N

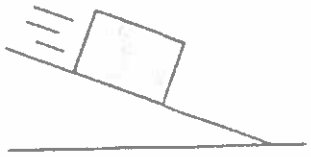
6. A 15 kg block has a constant acceleration of $2.2\ m/s^2$ down a 30° incline.



What is the magnitude of the friction force on the block?

A. 33 N
B. 41 N
C. 74 N
D. 130 N

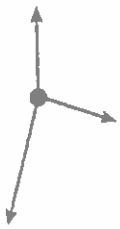
7. A block is on a frictionless incline.



Which of the following is a correct free body diagram for the block?

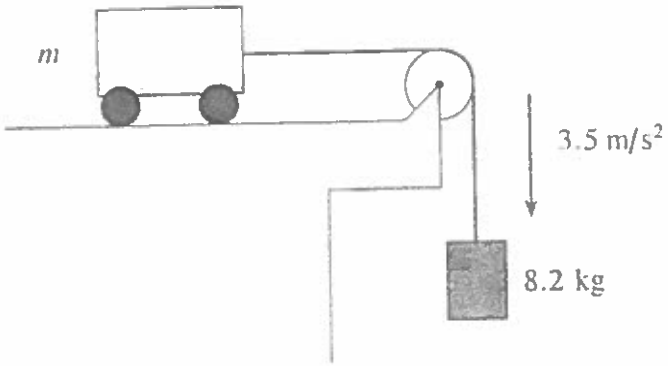
A. 

B. 

C. 

D. 

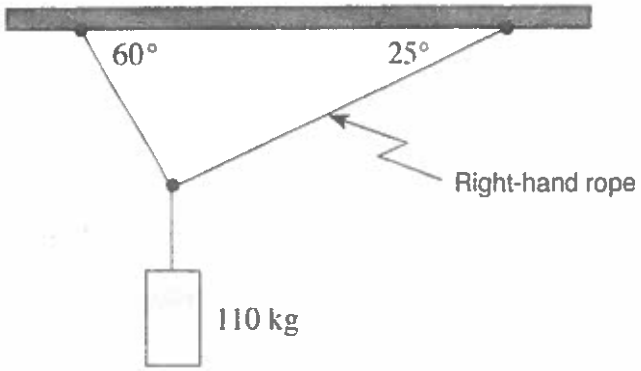
8. A cart on a frictionless surface is attached to a hanging mass of 8.2 kg.



If this system accelerates at 3.5 m/s², what is the mass m of the cart?

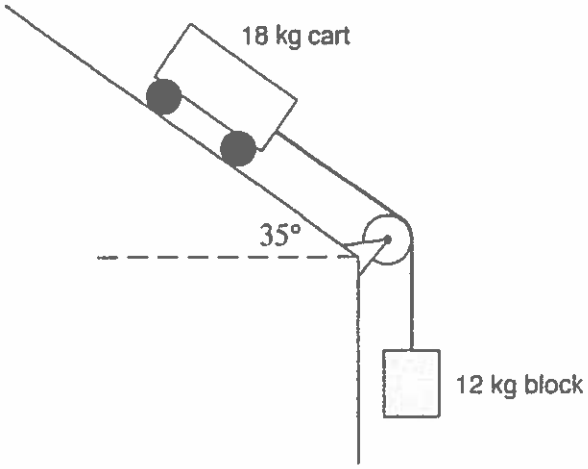
A. 6.0 kg
B. 15 kg
C. 23 kg
D. 31 kg

9. A 110 kg object is supported by two ropes attached to the ceiling. What is the tension T in the right-hand rope?



A. 460 N
B. 540 N
C. 930 N
D. 1 300 N

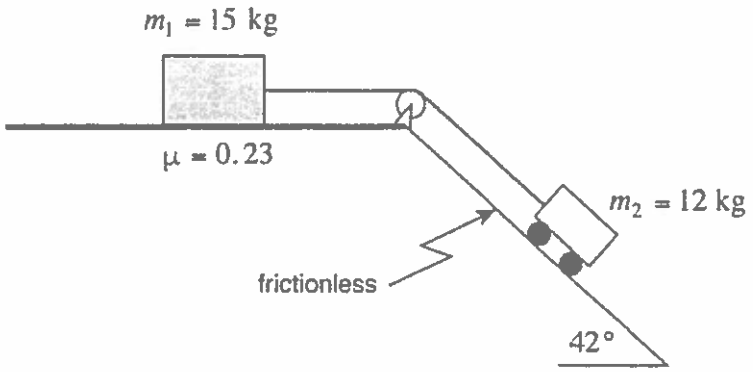
1. An 18 kg cart is connected to a 12 kg hanging block as shown. (Ignore friction.)



a) Draw and label a free body diagram for the 18 kg cart. **(2 marks)**

b) What is the magnitude of the acceleration of the cart? **(5 marks)**

2. Two objects are connected as shown. The 12 kg cart is on a frictionless 42° incline while the 15 kg block is on a horizontal surface having a coefficient of friction $\mu = 0.23$.



Determine the acceleration of the system of masses. **(7 marks)**