ANSWERS ON LAST PAGE

Q5.1

A car engine is suspended from a chain linked at *O* to two other chains. Which of the following forces *should* be included in the free-body diagram for the engine?

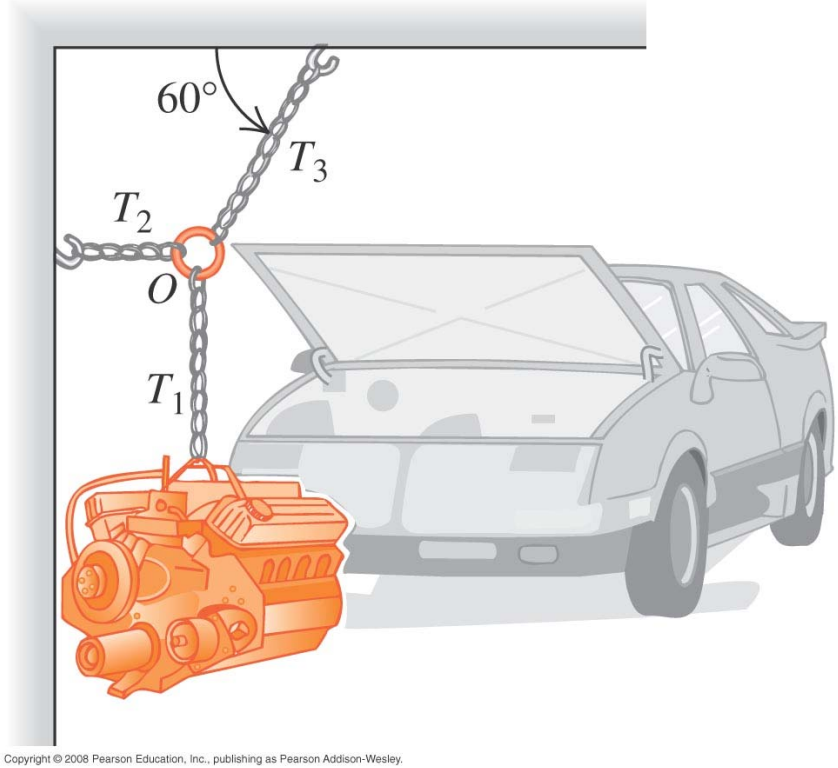
A. tension T_1

B. tension T_2

C. tension T_3

D. two of the above

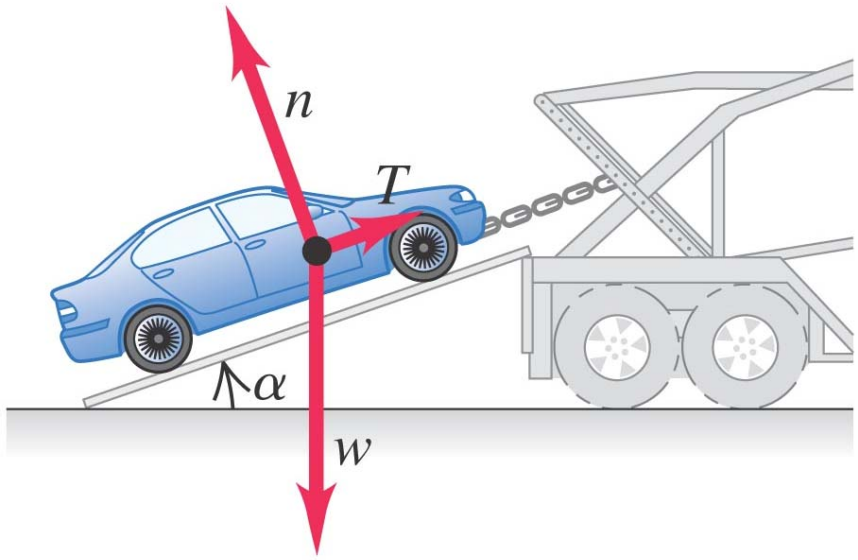
E. all of T_1, T_2, and T_3



Q5.2

A cable attached to a car holds the car at rest on the frictionless ramp (angle α).

The ramp exerts a normal force on the car. How does the magnitude n of the normal force compare to the weight w of the car?



A. $n = w$

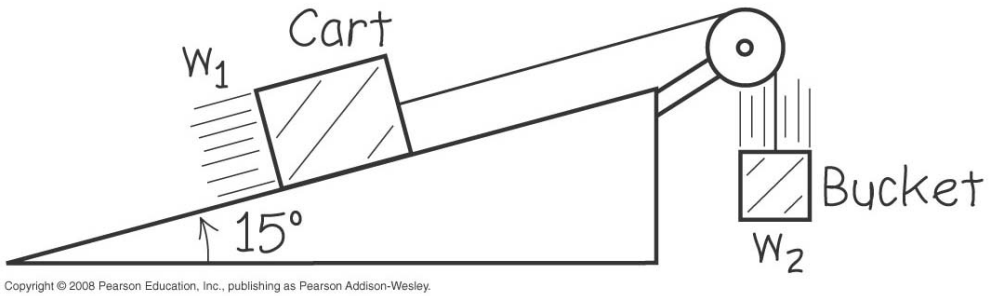
B. $n > w$

C. $n < w$

D. not enough information given to decide

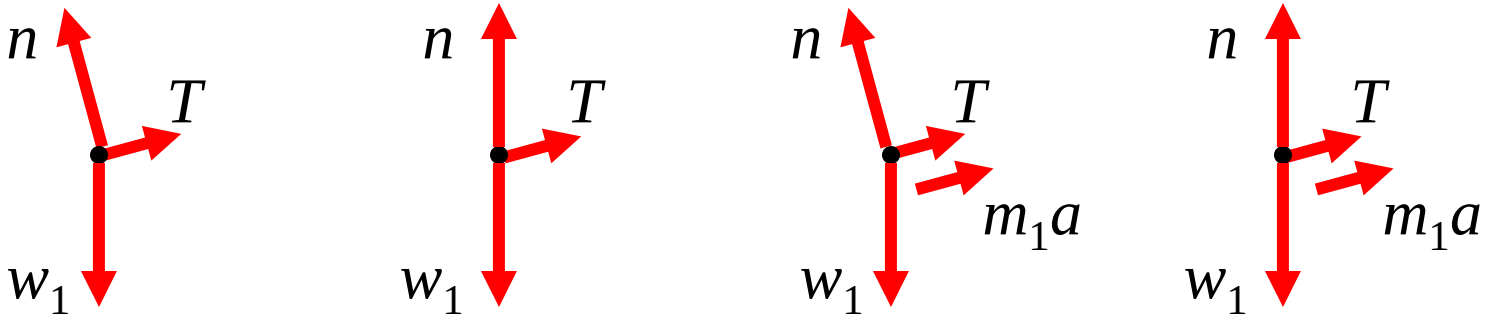
Q5.3

A cart (weight w_1) is attached by a lightweight cable to a bucket (weight w_2) as shown. The ramp is frictionless.



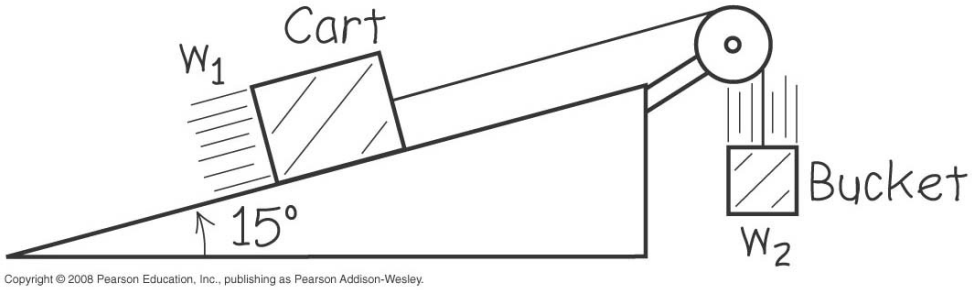
When released, the cart accelerates up the ramp.

Which of the following is a *correct* free-body diagram for the *cart?*



Q5.4

A cart (weight w_1) is attached by a lightweight cable to a bucket (weight w_2) as shown. The ramp is frictionless. The pulley is frictionless and does not rotate.



When released, the cart accelerates up the ramp and the bucket accelerates downward. How does the cable tension T compare to w_2?

A. $T = w_2$

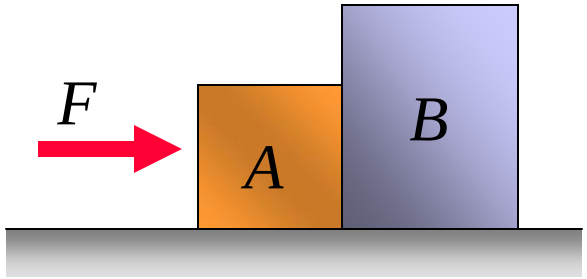
B. $T > w_2$

C. $T < w_2$

D. not enough information given to decide

Q5.5

A lightweight crate (*A*) and a heavy crate (*B*) are side-by-side on a frictionless horizontal surface. You are applying a horizontal force *F* to crate *A*. Which of the following forces *should* be included in a free-body diagram for crate *B*?



A. the weight of crate *B*

B. the force of crate *B* on crate *A*

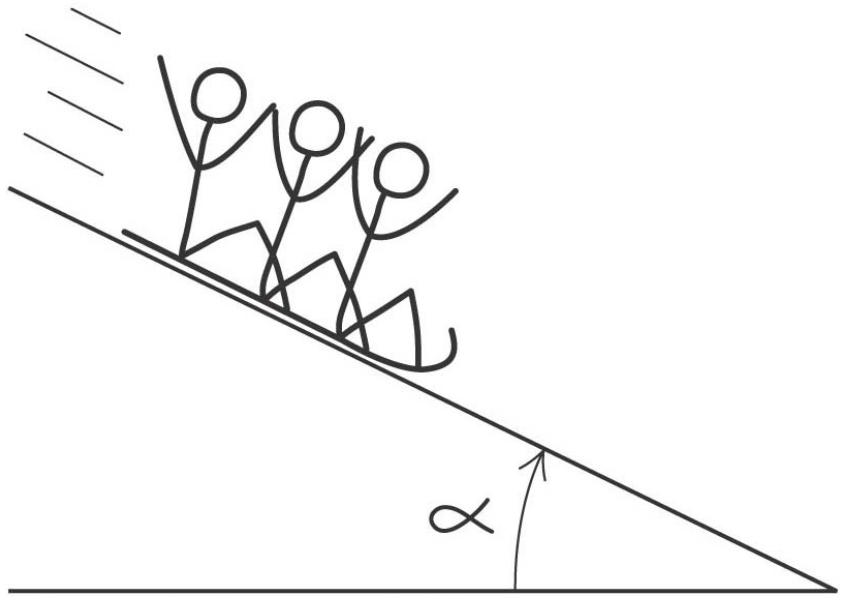
C. the force *F* that you exert

D. the acceleration of crate *B*

E. more than one of the above

Q5.6

A toboggan of weight w (including the passengers) slides down a hill of angle α at a constant speed. Which statement about the normal force on the toboggan (magnitude n) is *correct?*



A. $n = w$

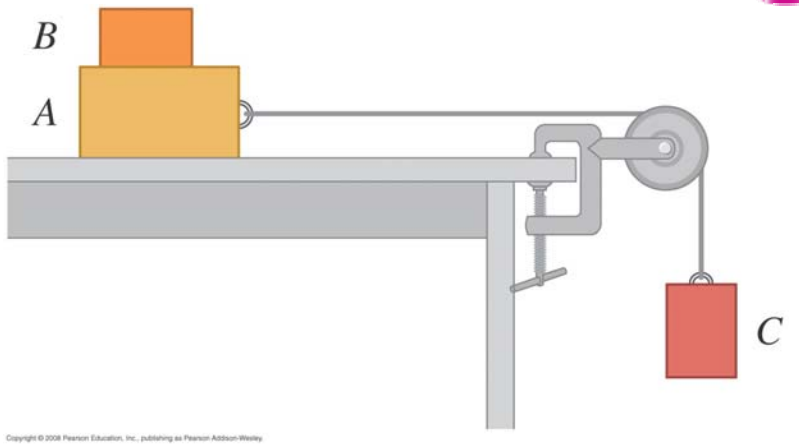
B. $n > w$

C. $n < w$

D. not enough information given to decide

Q5.7

Blocks *A* and *C* are connected by a string as shown. When released, block *A* accelerates to the right and block *C* accelerates downward.



There is friction between blocks *A* and *B*, but not enough to prevent block *B* from slipping. If you stood next to the table during the time that block *B* is slipping on top of block *A*, you would see

A. block *B* accelerating to the right.

B. block *B* accelerating to the left.

C. block *B* moving at constant speed to the right.

D. block *B* moving at constant speed to the left.

Q5.8

You are walking on a level floor. You are getting good traction, so the soles of your shoes don't slip on the floor.

Which of the following forces *should* be included in a free-body diagram for your body?

A. the force of kinetic friction that the floor exerts on your shoes

B. the force of static friction that the floor exerts on your shoes

C. the force of kinetic friction that your shoes exert on the floor

D. the force of static friction that your shoes exert on the floor

E. more than one of these

ANSWERS for Q5.:
1A 2C 3A 4C 5A
6C 7A 8B