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?

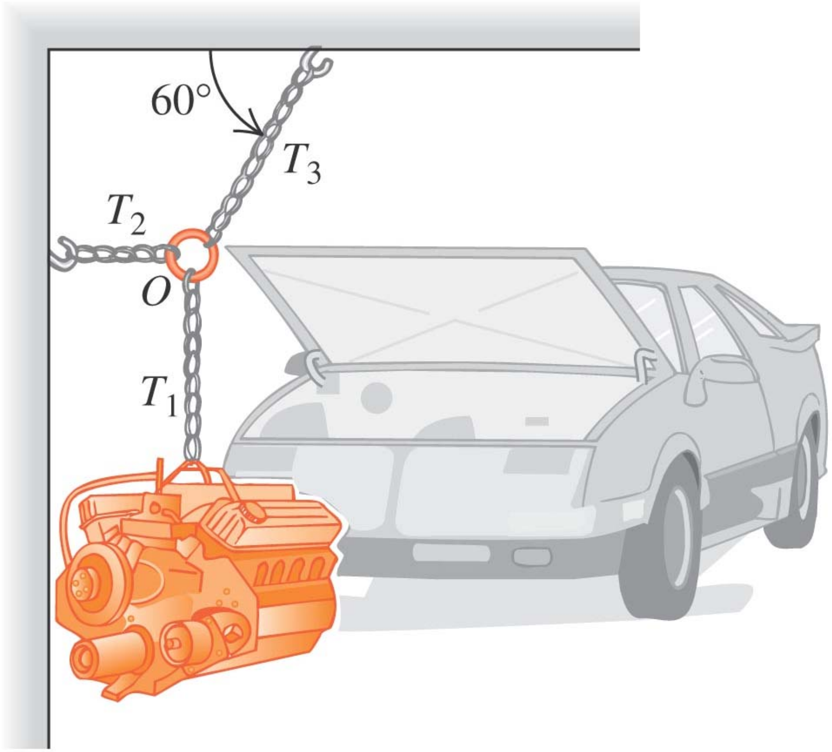
A. tension T_1

B. tension T_2

C. tension T_3

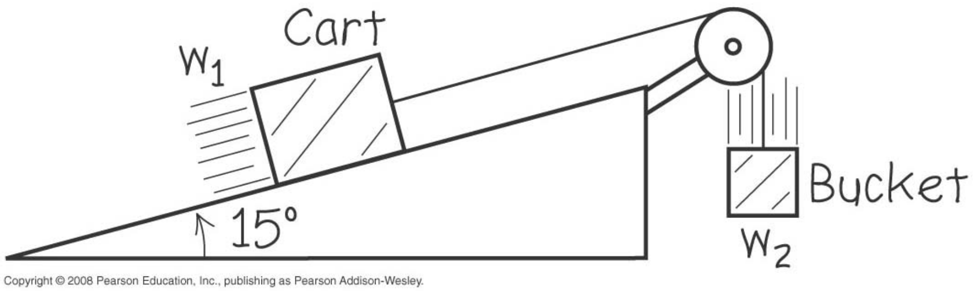
D. two of the above

E. all of T_1, T_2, and T_3



Q5.4

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. $T = w_2$

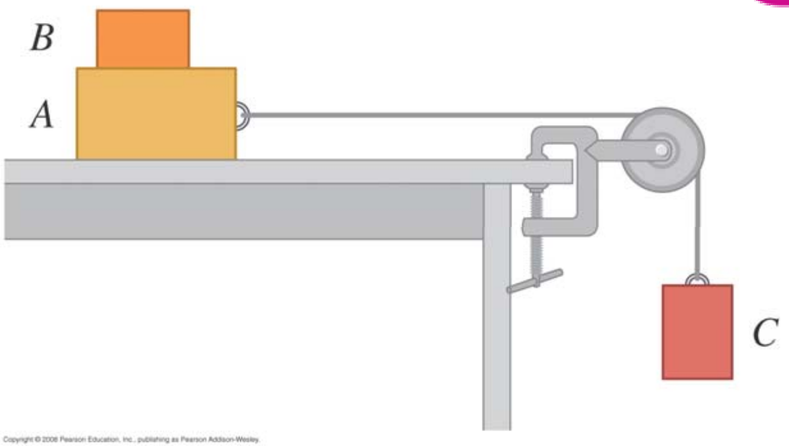
B. $T > w_2$

C. $T < w_2$

D. not enough information given to decide

Q5.7

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.

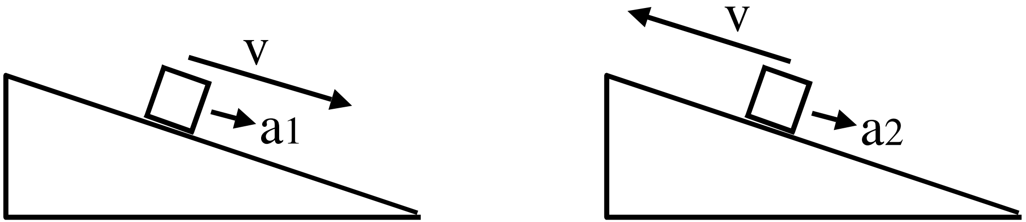
B. block *B* accelerating to the left.

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

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

6-7 An object slides down a rough inclined plane with some non-zero acceleration a_1. (There is friction)

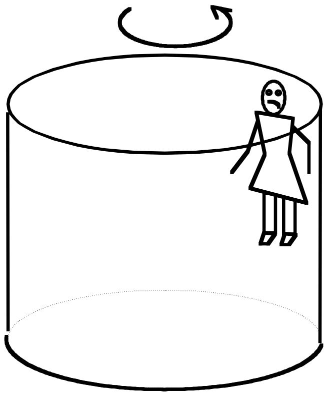
The same mass is shoved up the same incline with a large, brief initial push. As the mass moves up the incline, its acceleration is a_2.

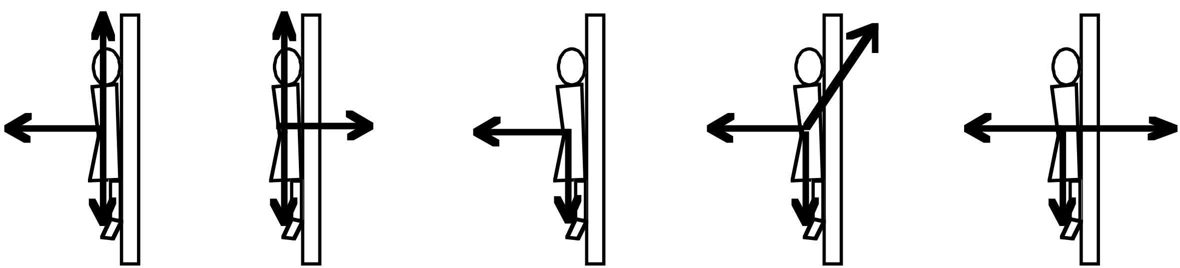


How do a_1 and a_2 compare?

A: $a_1 > a_2$ B: $a_1 = a_2$ C: $a_1 < a_2$

6-13 A rider in a "barrel of fun" finds herself stuck with her back to the wall. Which diagram correctly shows the forces acting on her?

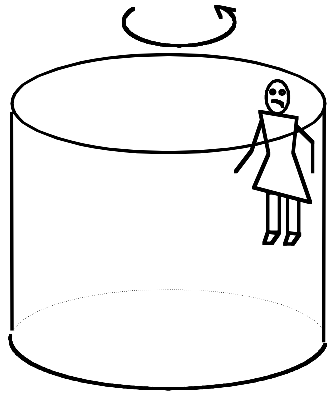




A	B	C	D	E

6-14

For the rider in the "barrel of fun" (stuck with her back to the wall), which formula below gives the magnitude of static friction? $F_{fr,S} = ...$



A: $\mu_S N$

B: $\mu_K N$

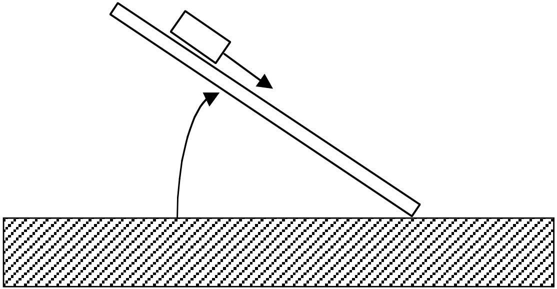
C: mg

D: mv^2/R

E: none of these

Which formula above is the magnitude of the Normal force, N = ...

6-3 A block on a rough inclined plane is stationary. The plane is slowly tilted more, until the block just starts to slide.



After the block begins to slide, its acceleration is

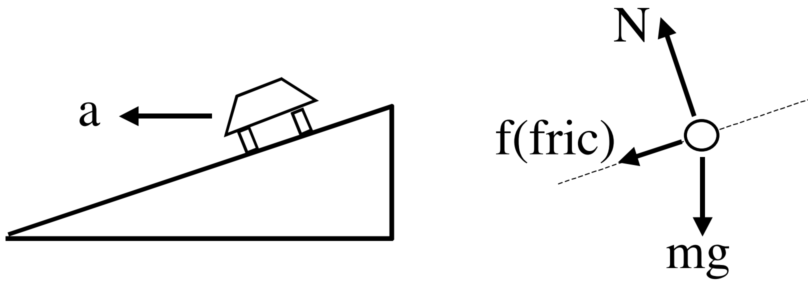
A: zero (it slides with constant velocity)

B: non-zero (and it slides faster and faster)

C: non-zero (and it slides slower and slower)

D: Not enough info to decide.

6-15 A car rounds a banked curve at some speed without skidding. The radius of curvature of the curve is R. A possible free-body diagram (which may or may not be correct) is shown.



What can you say about f_{fric}, the magnitude of the force of friction?

A: $f_{fric} = \mu_S N$ B: $f_{fric} = \mu_K N$ C: Neither.

What can you say about the direction of f_{fric}?

A: It is in the direction shown in the free-body diagram.

B: It is in the direction opposite shown in the diagram.

C: The direction depends on the speed of the car.