Question 6.1a  Tension I

You tie a rope to a tree and you pull on the rope with a force of 100 N. What is the tension in the rope?

a) 0 N  
b) 50 N  
c) 100 N  
d) 150 N  
e) 200 N
Two tug-of-war opponents each pull with a force of 100 N on opposite ends of a rope. What is the tension in the rope?

a) 0 N  
b) 50 N  
c) 100 N  
d) 150 N  
e) 200 N
Question 6.1c  Tension III

You and a friend can each pull with a force of 20 N. If you want to rip a rope in half, what is the best way?

a) you and your friend each pull on opposite ends of the rope
b) tie the rope to a tree, and you both pull from the same end
c) it doesn’t matter—both of the above are equivalent
d) get a large dog to bite the rope
Question 6.2  Three Blocks

Three blocks of mass 3m, 2m, and m are connected by strings and pulled with constant acceleration \( a \). What is the relationship between the tension in each of the strings?

a) \( T_1 > T_2 > T_3 \)  
b) \( T_1 < T_2 < T_3 \)  
c) \( T_1 = T_2 = T_3 \)  
d) all tensions are zero  
e) tensions are random
In which case does block $m$ experience a larger acceleration? In case (1) there is a 10 kg mass hanging from a rope and falling. In case (2) a hand is providing a constant downward force of 98 N. Assume massless ropes.

a) case (1)  
b) acceleration is zero  
c) both cases are the same  
d) depends on value of $m$  
e) case (2)
A box sits in a pickup truck on a frictionless truck bed. When the truck accelerates forward, the box slides off the back of the truck because:

- a) the force from the rushing air pushed it off
- b) the force of friction pushed it off
- c) no net force acted on the box
- d) truck went into reverse by accident
- e) none of the above
Antilock brakes keep the car wheels from locking and skidding during a sudden stop. Why does this help slow the car down?

a) $\mu_k > \mu_s$ so sliding friction is better

b) $\mu_k > \mu_s$ so static friction is better

c) $\mu_s > \mu_k$ so sliding friction is better

d) $\mu_s > \mu_k$ so static friction is better

e) none of the above
Your little sister wants you to give her a ride on her sled. On level ground, what is the easiest way to accomplish this?

a) pushing her from behind
b) pulling her from the front
c) both are equivalent
d) it is impossible to move the sled
e) tell her to get out and walk
Question 6.7  Will It Budge?

A box of weight 100 N is at rest on a floor where $\mu_s = 0.4$. A rope is attached to the box and pulled horizontally with tension $T = 30$ N. Which way does the box move?

a) moves to the left
b) moves to the right
c) moves up
d) moves down
e) the box does not move
A box sits on a flat board. You lift one end of the board, making an angle with the floor. As you increase the angle, the box will eventually begin to slide down. Why?

- a) component of the gravity force parallel to the plane increased
- b) coefficient of static friction decreased
- c) normal force exerted by the board decreased
- d) both #1 and #3
- e) all of #1, #2, and #3
A mass $m$ is placed on an inclined plane ($\mu > 0$) and slides down the plane with constant speed. If a similar block (same $\mu$) of mass $2m$ were placed on the same incline, it would:

- a) not move at all
- b) slide a bit, slow down, then stop
- c) accelerate down the incline
- d) slide down at constant speed
- e) slide up at constant speed