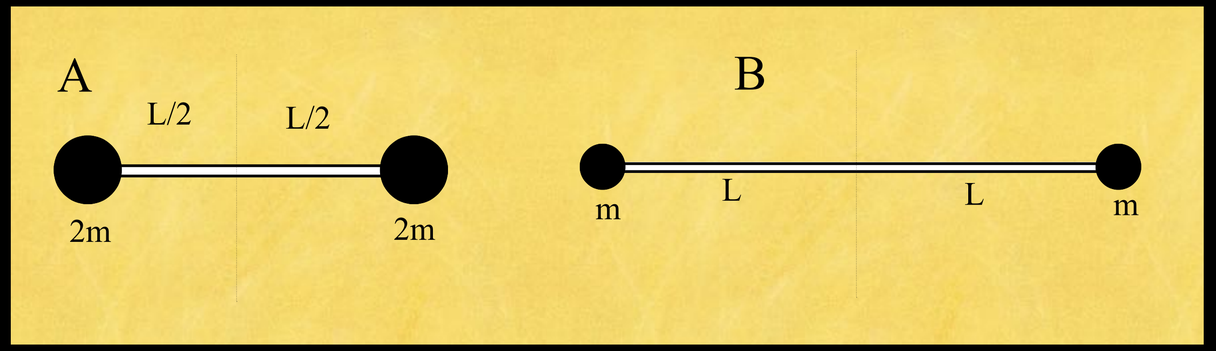
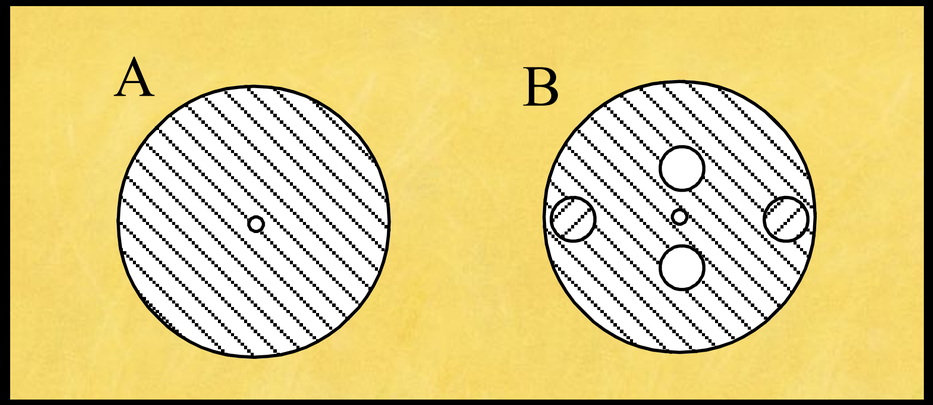
Consider two masses, each of size 2m at the ends of a light rod of length L with the axis of rotation through the center of the rod. The rod is doubled in length and the masses are halved. What happens to I?



A) I_A is bigger
B) I_B is bigger
C) $I_A = I_B$

Consider a solid disk with an axis of rotation through the center (perpendicular to the diagram). Two holes are cut out near the center and the material is placed near the rim. Which has the larger I?

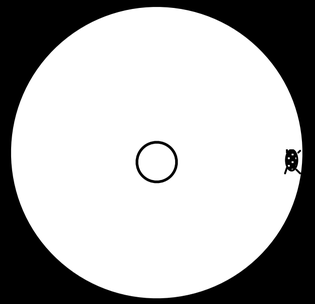


A) $I_A > I_B$

B) $I_A < I_B$

C) $I_A = I_B$

A ladybug is clinging to the rim of a spinning wheel which is spinning counterclockwise very fast and is slowing down. At the moment shown, what is the approximate direction of the ladybug's acceleration?



A) 

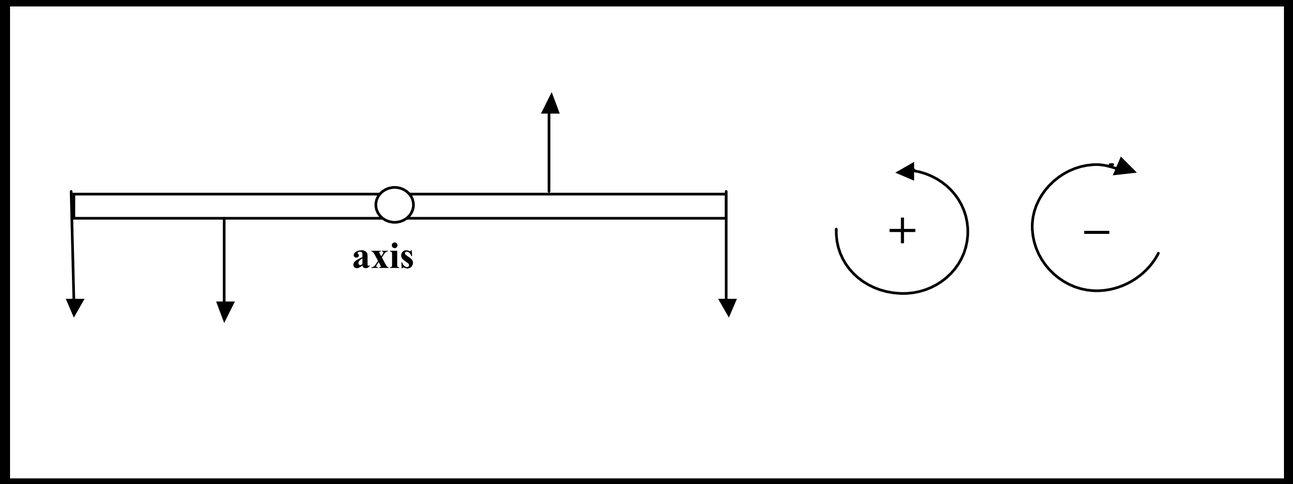
B) 

C) 

D) 

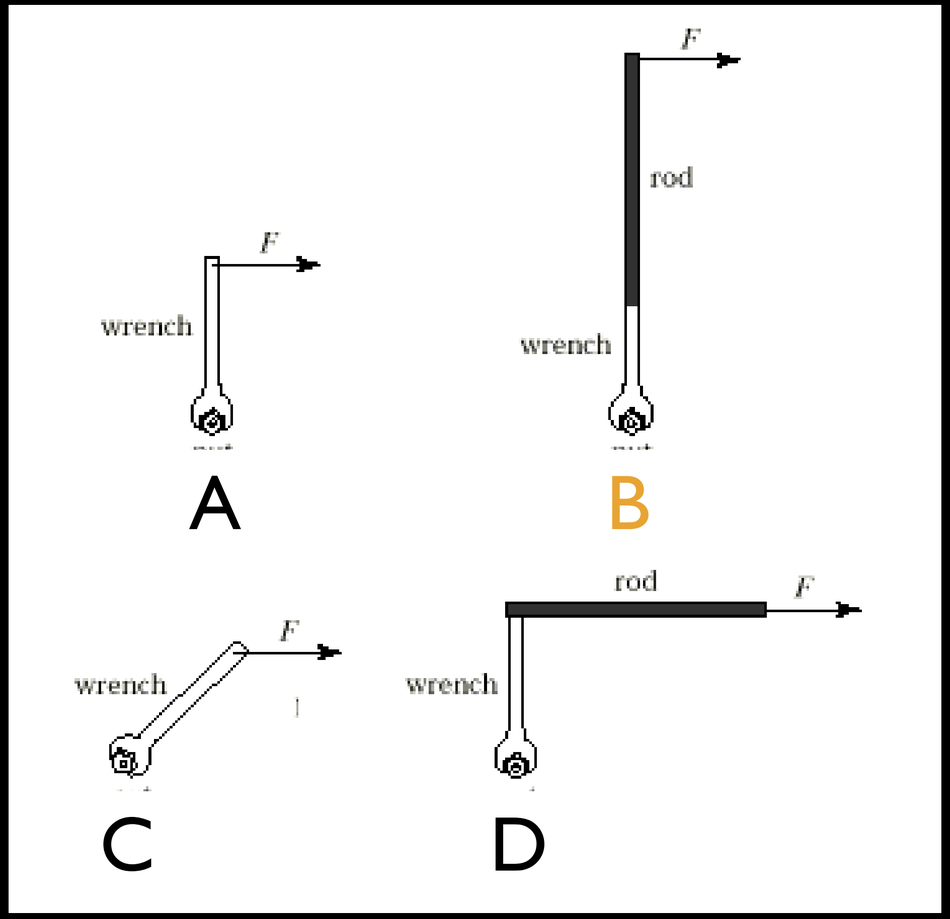
E) None of these

A bar has four forces, all of the same magnitude, exerted on it, as shown. What is the sign of the torque about the axis of rotation? Use the sign convention shown.

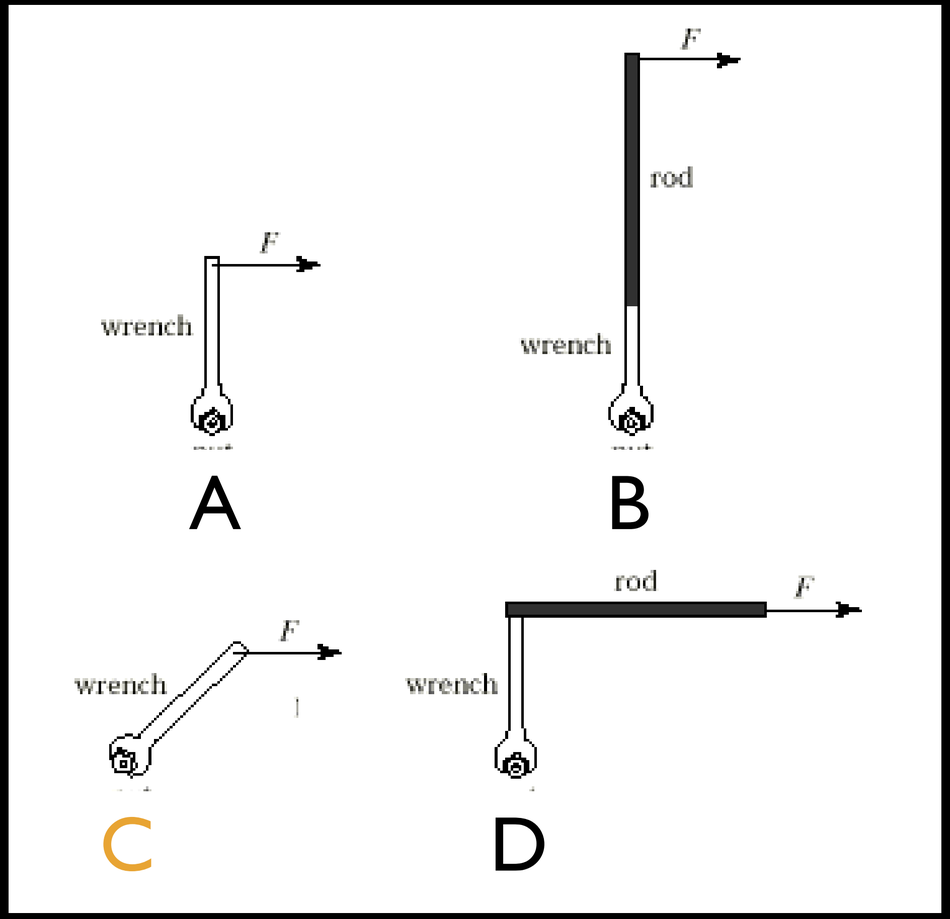


A) Torque is zero
B) Torque is positive
C) Torque is negative

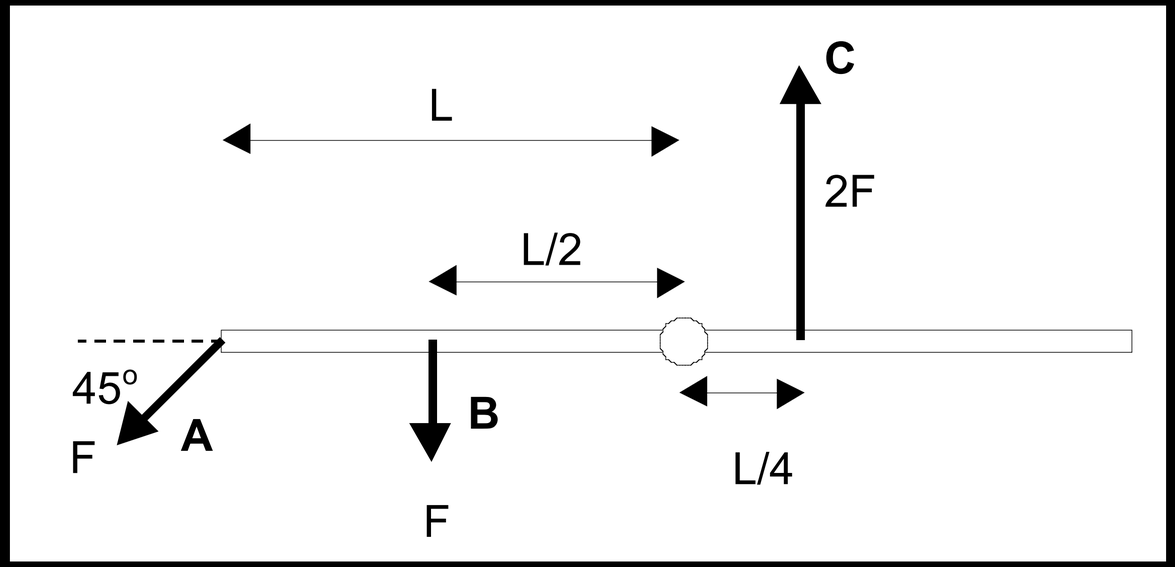
You are using a wrench and trying to loosen a rusty nut. Which of the arrangements shown is most effective in loosening the nut?



You are using a wrench and trying to loosen a rusty nut. Which of the arrangements shown is *least* effective in loosening the nut?



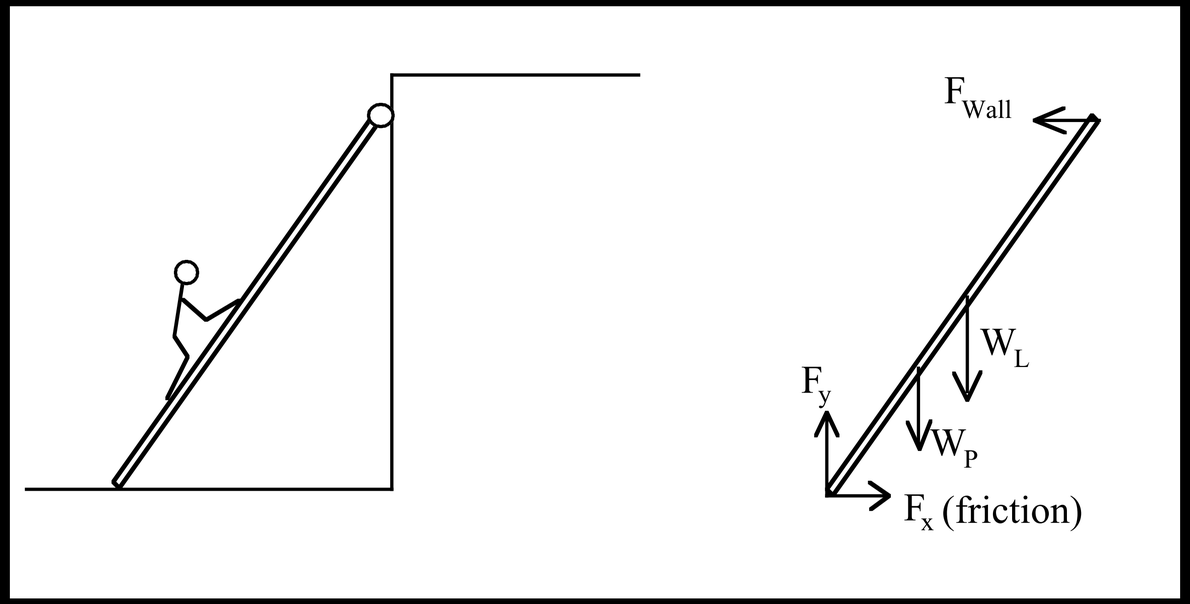
Three forces labeled A, B, C are applied to a rod which pivots on an axis thru its center.



Which force causes the largest magnitude torque?

A) A B) B C) C
D) two or more forces tie for largest size torque.

A ladder of weight W_L leans against a wall. The ladder has rollers at the top so that the wall exerts a normal force only on the top of the ladder. A person of weight W_P slowly climbs the ladder. A free-body diagram for the ladder is shown.

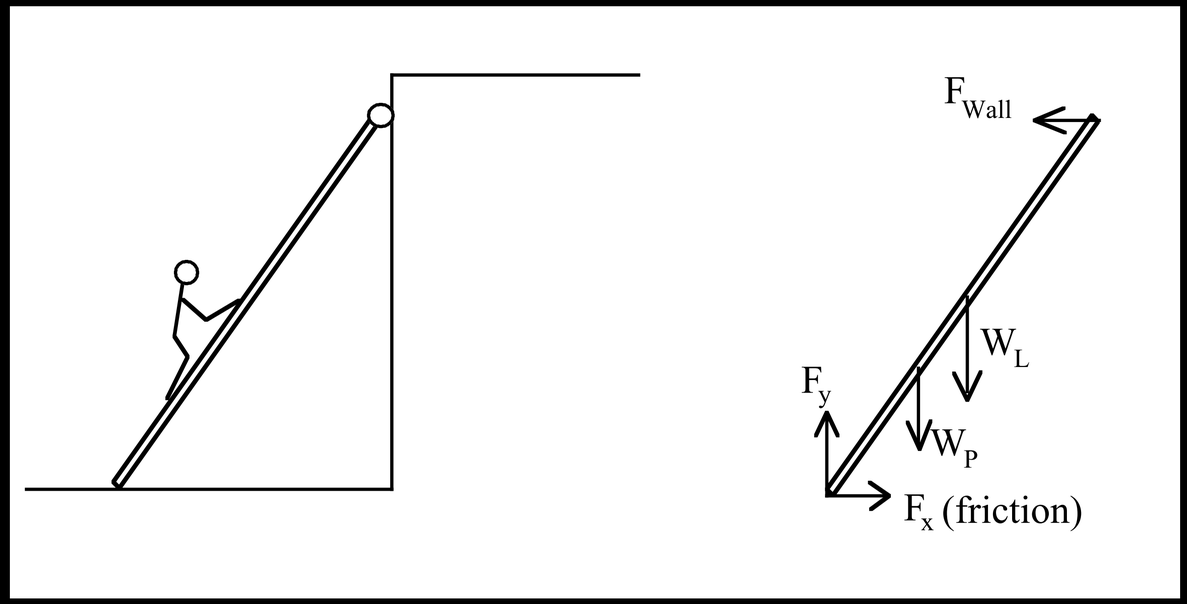


As the person ascends the ladder, the force from the wall (F_{wall})

A) increases B) decreases C) stays the same.

(Hint: Consider τ about the point where the ladder touches the ground.)

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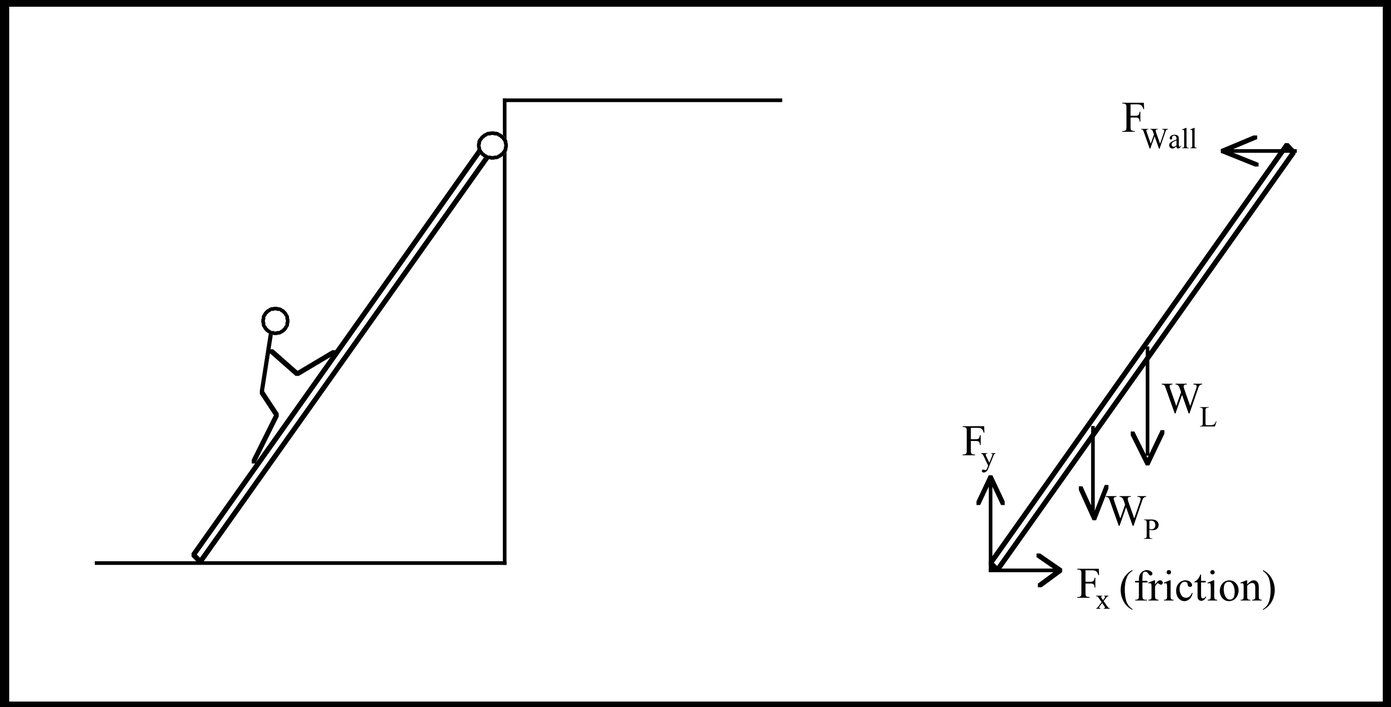


As the person ascends the ladder the force of friction F_x, between the ladder and the ground...

A) increases B) decreases C) stays the same.

(Hint: Consider τ about the point where the ladder touches the ground.)

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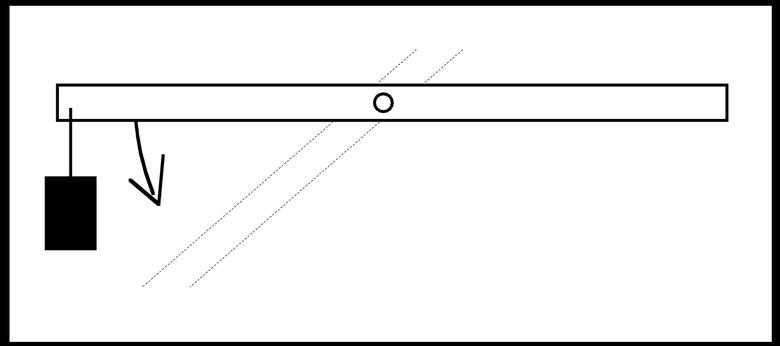


The ladder is more likely to slip when the person is...

A) lower B) higher C) doesn't matter.

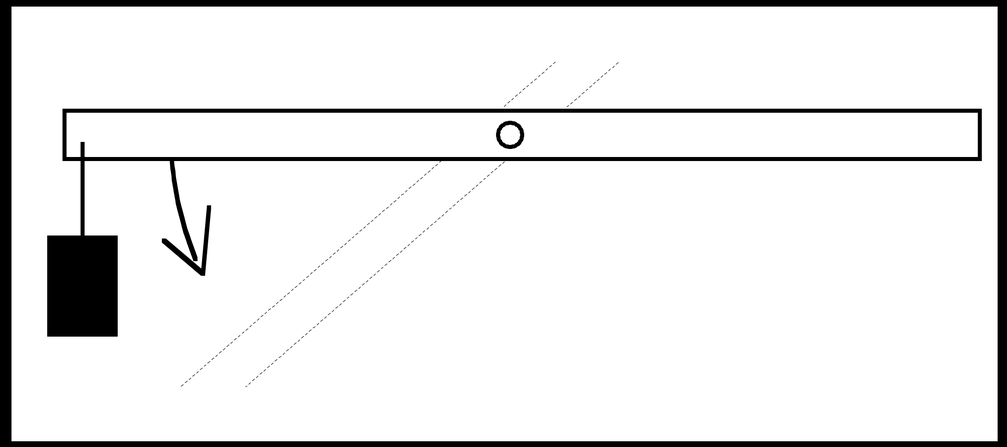
A mass is hanging from the end of a horizontal bar which pivots about an axis through it center, but it being held stationary. The bar is released and begins to rotate.
As the bar rotates from horizontal to vertical, the magnitude of the torque on the bar..

A) remains constant
B) increases
C) decreases



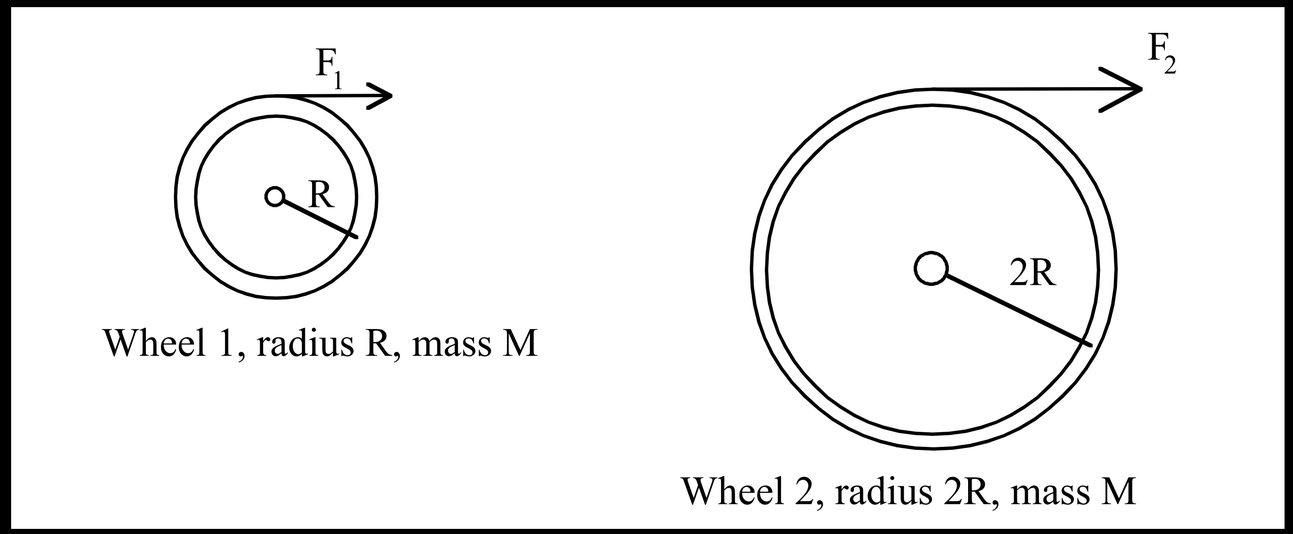
A mass is hanging from the end of a horizontal bar which pivots about an axis through it center, but it being held stationary. The bar is released and begins to rotate. As the bar rotates from horizontal to vertical, the magnitude of the *angular acceleration* of the bar..

A) remains constant
B) increases
C) decreases



Two wheels with fixed axles, each have the **same mass M**, but wheel 2 has twice the radius of wheel 1. Each is accelerated from rest with a force applied as shown. In order to impart identical angular accelerations to both wheels, how much larger is F_2 than F_1?

(Assume that all the mass of the wheels is concentrated in the rims so that the moment of inertia of each is of the form $I = M R^2$ (hoop formula), and recall that $\tau = I \alpha$)



A) $F_2 = F_1$
B) $F_2 = 2\ F_1$
C) $F_2 = 4\ F_1$
D) $F_2 = 8\ F_1$
E) None of these