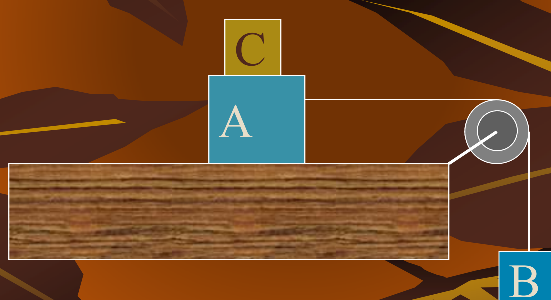
PHYS 210 - General Physics I

- Newton's Laws of Motion
- Rotation and forces

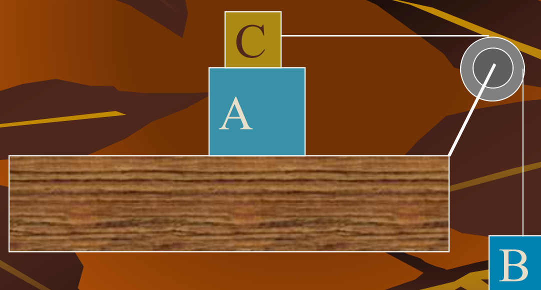
EX:

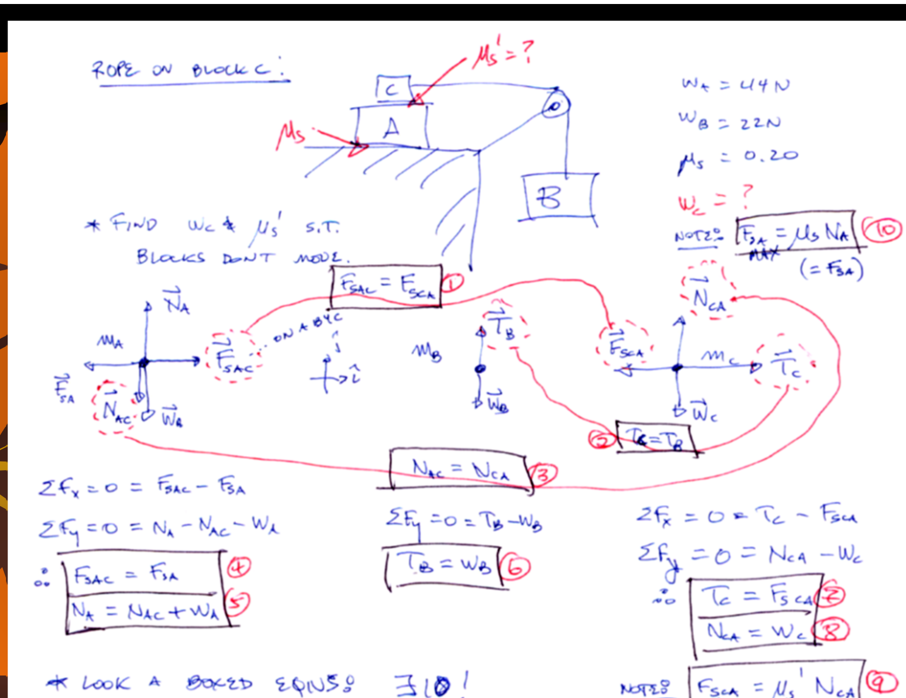
- **Blocks A and B have weights of 44 N and 22 N, respectively. Determine the minimum weight of block C to keep A from sliding if μ_s between block A and the table is 0.20.**

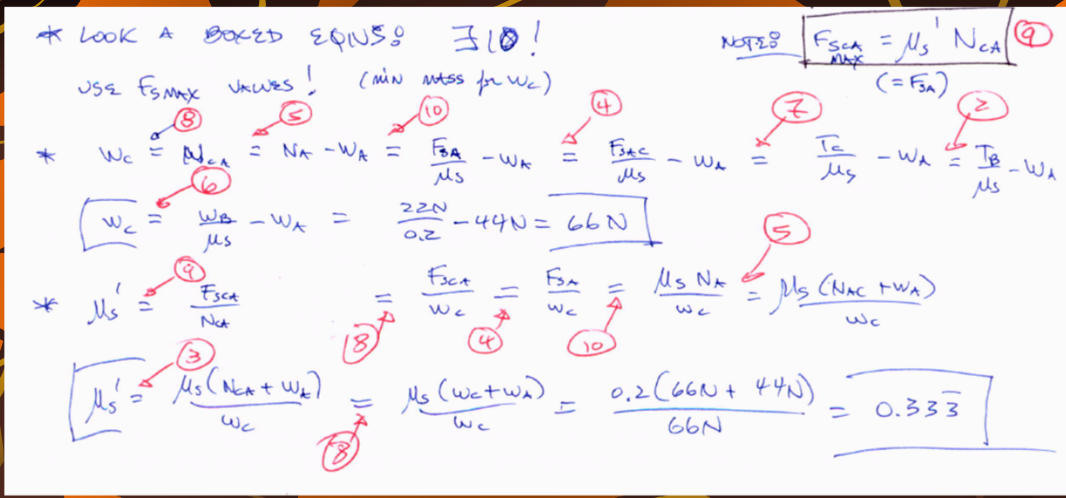


EX:

- **Blocks A and B have weights of 44 N and 22 N, respectively. Determine the minimum weight of block C and the value of μ'_s between block C and A to keep A from sliding if μ_s between block A and the table is 0.20.**





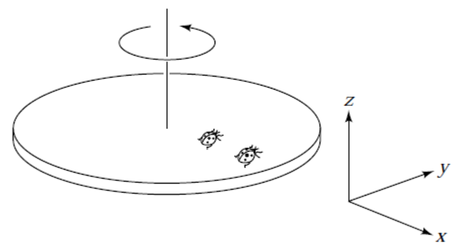


Newton's Laws of Motion

These also work for rotational motion!

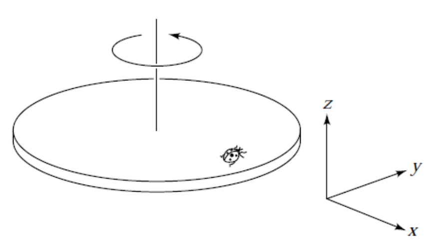
1. If $\vec{F}_{NET} = 0$, then $\vec{v} = \text{constant}$
   - Mass is a measure of inertia
2. $\vec{F}_{NET} = m\vec{a}$
   - SI unit of force is the Newton [N]
   - The net force is parallel to the acceleration!
3. $\vec{F}_{12} = -\vec{F}_{21}$

A ladybug sits at the outer edge of a merry-go-round, and a gentleman bug sits halfway between her and the axis of rotation. The merry-go-round makes a complete revolution once each second. The gentleman bug's angular speed is



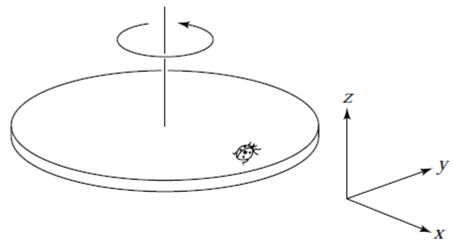
1. half the ladybug's.
2. the same as the ladybug's.
3. twice the ladybug's.
4. impossible to determine

A ladybug sits at the outer edge of a merry-go-round, that is turning and slowing down. At the instant shown in the figure, the radial component of the ladybug's (Cartesian) acceleration is



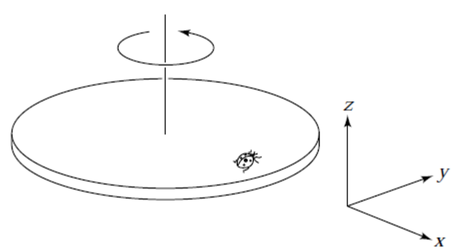
1. in the $+x$ direction.
2. in the $-x$ direction.
3. in the $+y$ direction.
4. in the $-y$ direction.
5. in the $+z$ direction.
6. in the $-z$ direction.
7. zero.

A ladybug sits at the outer edge of a merry-go-round that is turning and slowing down. The tangential component of the ladybug's (Cartesian) acceleration is



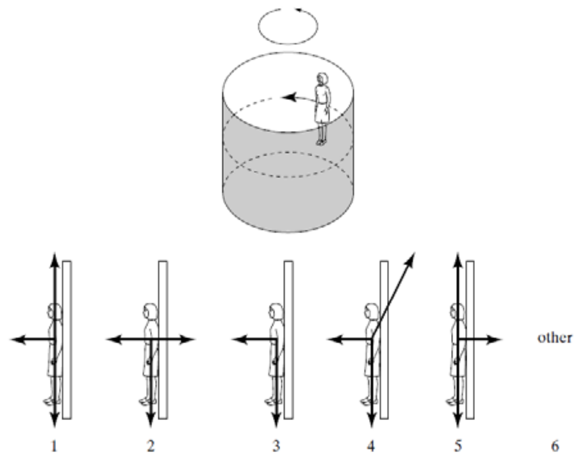
1. in the $+x$ direction.
2. in the $-x$ direction.
3. in the $+y$ direction.
4. in the $-y$ direction.
5. in the $+z$ direction.
6. in the $-z$ direction.
7. zero.

A ladybug sits at the outer edge of a merry-go-round that is turning and is slowing down. The vector expressing her angular velocity is



1. in the $+x$ direction.
2. in the $-x$ direction.
3. in the $+y$ direction.
4. in the $-y$ direction.
5. in the $+z$ direction.
6. in the $-z$ direction.
7. zero.

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?



Have a great weekend!