All answers in terms of \( m, \gamma, \text{ and } g \)

1. In a vector.
   \[ \vec{N} = \text{accel} \]

2. What is the resultant acceleration acting on the block?

Q: What are the forces acting on the block?

\( \theta \)
(1) Draw a PBD on the force vector I just drew (force vector: \( \mathbf{F} \)).

(F) \( \mathbf{F} \)

Friction:

Note: Always use the normal force in the friction force vector.

(F) \( \mathbf{F} \)

Phy.

Norm.

_TODO:

Plot the force at the point (x, y) with orientation.

(F) \( \mathbf{F} \)

Draw a PBD on the force vector I just drew.

\( \mathbf{F} \)
(1) Set up a coordinate system (e.g., x, y)

(2) Let the position be as shown.

Guidelines: If you have the acceleration, make the diagram so that it simulates the situation.
(3) Black and red that don't overlap point

(2) Break any red that don't overlap point

Slanted in red ("extending an axis")

Along one of your axes into components

Only one of your axes is a force that doesn't

axes would form an L/4 force that doesn't

of your axes (in this problem, either + or -)

but your components along one

magnify F as possible in your red

choose your axes so that as

Any guideline:
\( f_y = m g \cos \theta \)

Apply\[ F_y = m a_y \text{ centripetal} \]

\( \sin \theta = \frac{y}{a} \)

\( \sin \theta = \frac{a}{v} \)

\( x = \frac{1}{2} at^2, \text{ but not!} \quad y = \frac{1}{2} \) 

\( 0 \leq x \leq L \) 

\( 0 \leq \sin \theta \leq 1 \)

\( \theta = \arcsin \frac{a}{v} \)

Friction out will add a problem.
New problem: 

What happens if:

- The blocks are not 55% of combined weight?

Constraint:

- In contact with all masses
- In contact with rope
- Massless

Force assumptions:

3 kg

Weight of mass:

\[ \text{mass} \times g \]

Tension in rope:

\[ T \]

摩擦力: \( f \)
(1) FBD's

Mg

\[ F_T - mg = ma \]  \
Choose axes for every obj.

\[ F_T = ma \]

\[ H + F_T = H \]

\[ F_T \]

\[ F_{\text{top}} \]

Note: Step (3) is unnecessary as all Fs already point along our axes.
(→)

directly: eliminate «a» from the eq's

let's find F, but first, a way to find F:

we could find "a" first and then back substitute into

\[ \text{Step 1:} \quad g = F/T \]
\[ \text{Step 2:} \quad M = F/T \]
\[ \text{Step 3:} \quad mg = ma \]
\[ \text{Step 4:} \quad F = mg \]
\[ \text{Step 5:} \quad \text{solve these for F,} \]

we have 3 eq's:

in the lecture, the algebra (this was not actually covered)
\[
\frac{P_{t} \geq \frac{P_{t} + T_{t}}{h_{t} \left(1 + \frac{1}{h_{t}} \right)}}{b_{t} \left(1 + \frac{1}{h_{t}} \right) + \frac{b_{t} \left(1 + \frac{1}{h_{t}} \right)}{h_{t}}}
\]

\[
F_t = \frac{2(F_t + m)}{H + m} = 2Hmg
\]

\[
F_t = \frac{m + m - 2Hmg}{M_{t} + m - M_{t} - M_{t}} = H_{ma} - H_{mg}
\]

suggest that:

\[
2m \times m_{g} - m_{f} = m_{a}
\]

\[
\frac{m_{f} + m_{g} = m_{a}}{}
\]
Ask Hegh next time...

blocks. How can that be?

It; Less Than the combined weight of the

\[ \frac{4}{8} \cdot \frac{1}{2} \cdot (10 \, m/s^2) \geq \frac{1}{2} \cdot 10 \, m/s^2. \]

So the magnitude of the tension in the top rope

\[ F_{top}. \]