Free Body Diagrams

Principle way to convey your knowledge of a mechanics problem.

Your FBD is your explanation of where your Newton's Equations come from.

A FBD let's you and the reader check your work efficiently.

It is a mandatory convention of the profession.

Badly formed or omitted FBDs in solutions will result in a zero on a mechanics problem.

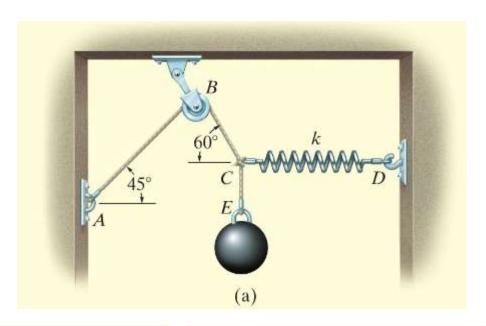


What is Required in an FBD?

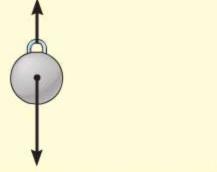
- 1. One separate FBD for each object of interest.
- 2. Each object of interest drawn separately.
- 3. Forces drawn as heavy arrows, labelled, acting at correct locations. Avoid components of forces except for reactions.
- 4. Dimensions and angles clearly indicated.
- 5. Axes should be drawn as dashed lines and labelled.
- 6. Acceleration drawn as a heavy, labelled, arrow to one side of the object.



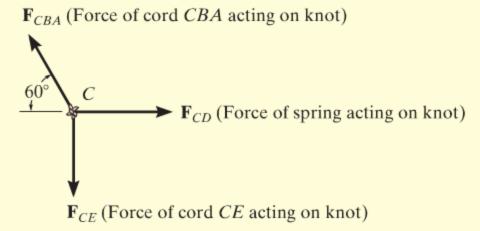
Examples



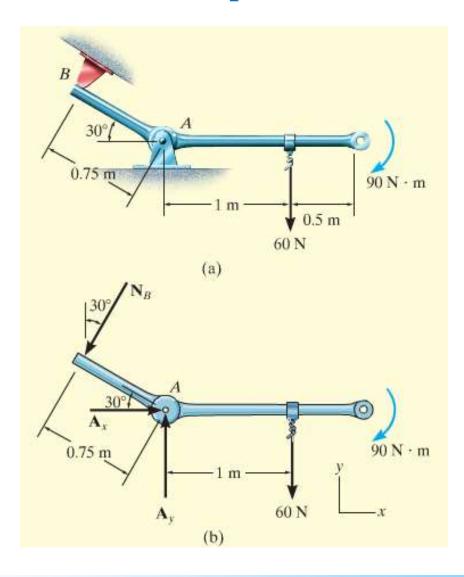
 \mathbf{F}_{CE} (Force of cord CE acting on sphere)



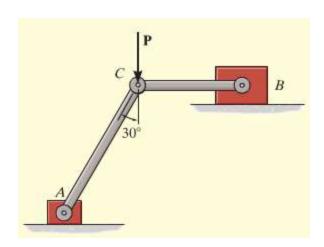
58.9 N (Weight or gravity acting on sphere)

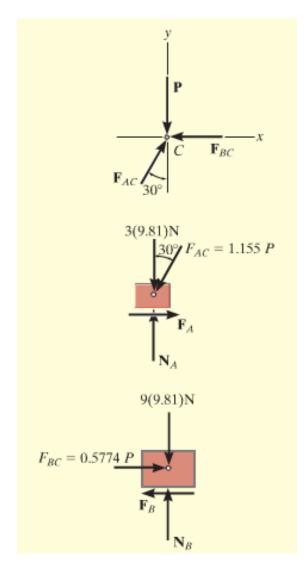


Examples



Examples





Free Body Diagrams

Newton's Law Equations should only use symbols and angles and distances defined in FBD.

A negative solution for a force must always be explained.

Remember normals only push and ropes only pull.

