

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.

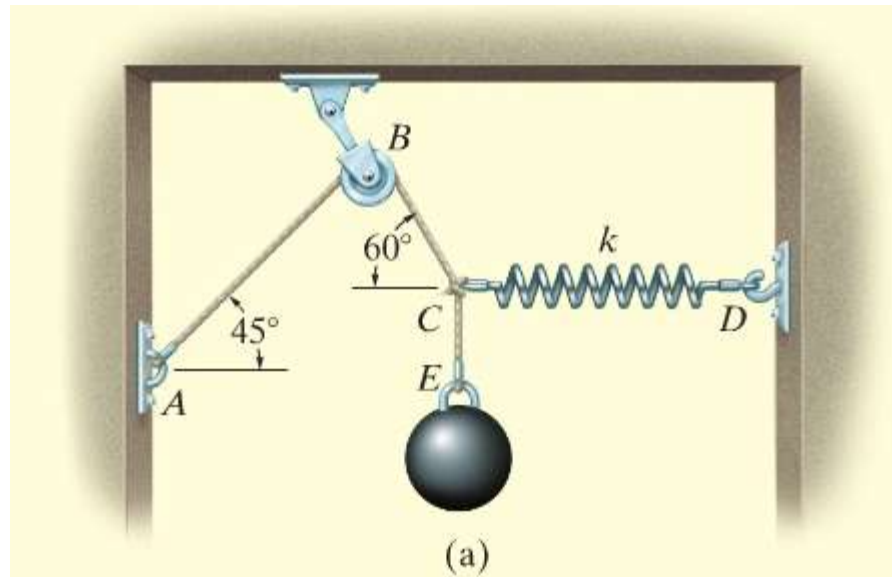


What is Required in an FBD?

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

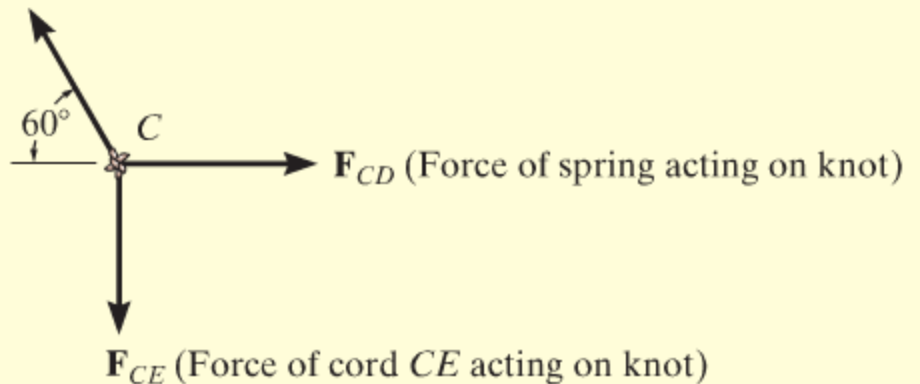


\mathbf{F}_{CE} (Force of cord CE acting on sphere)

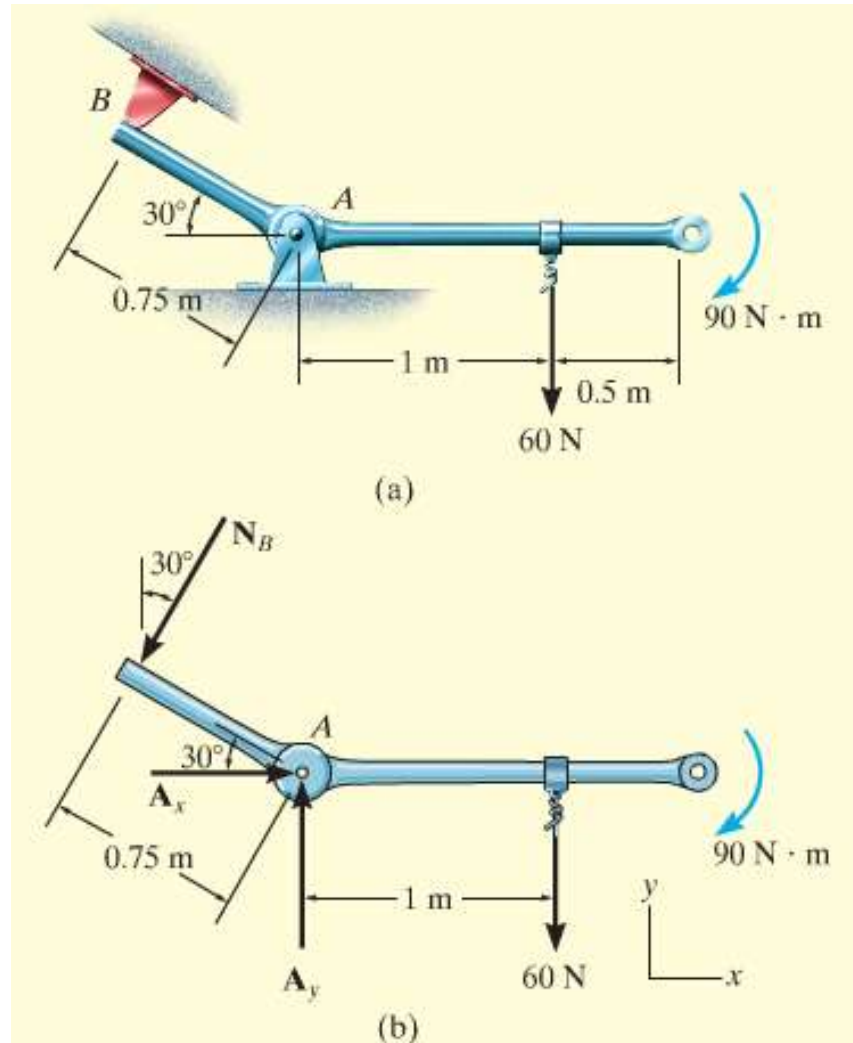


58.9 N (Weight or gravity acting on sphere)

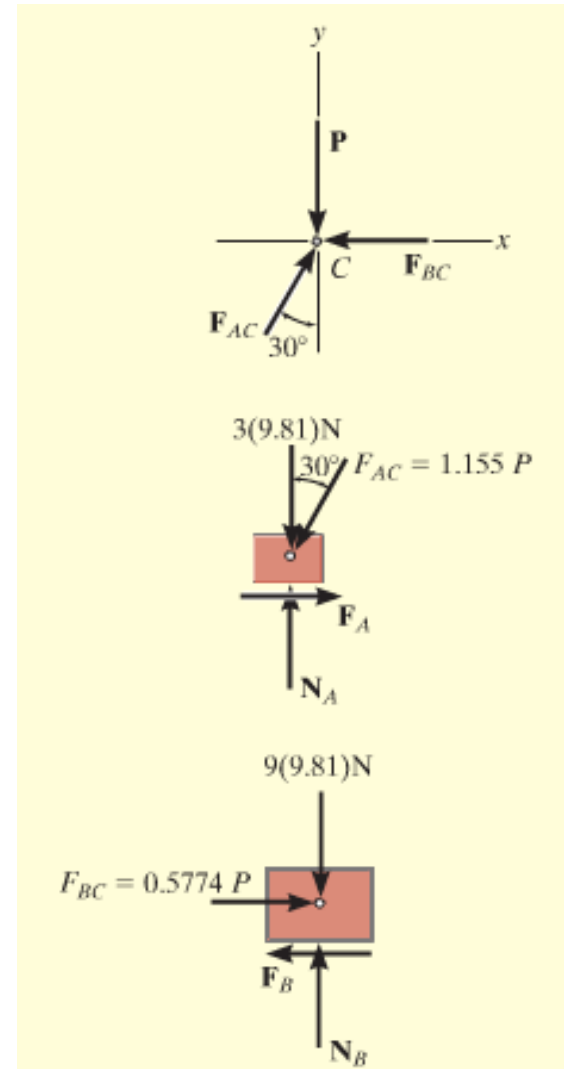
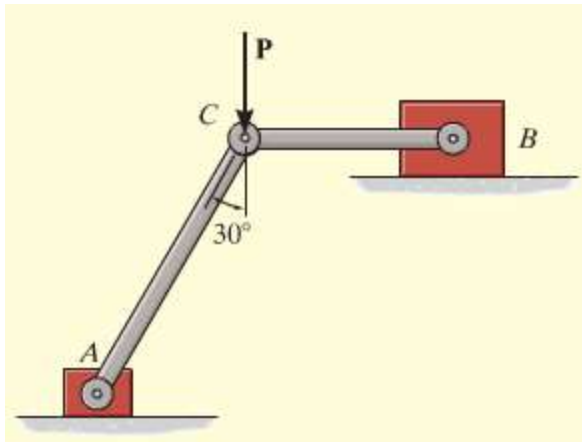
\mathbf{F}_{CBA} (Force of cord CBA acting on knot)



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.

