

Section 4.1 Reading Quiz:

- 1) What is a force? (1point)**
- 2) What is the SI unit of force? (1 point)**
- 3) What are the two categories (types) of force? (2 points)**
- 4) Give an example of each type of force from Q3. (2 points)**
- 5) What is Newton's Second Law? (2 points)**
- 6) What is net force? (1 point)**
- 7) What is equilibrium? (1 point)**

Honors Physics: Section 4.1 - Force and Motion

Force

What is force?

a push or pull exerted on an object

Variable: F

Units: Newton (N) $\Rightarrow 1\text{ N} = \frac{1\text{ kg} \cdot \text{m}}{\text{s}^2}$

Contact vs. Field Forces

forces that touch the object

forces that cannot touch the object

Free Body Diagrams (FBD)

- a visual representation (vector diagram) of all of the forces exerted on an object.

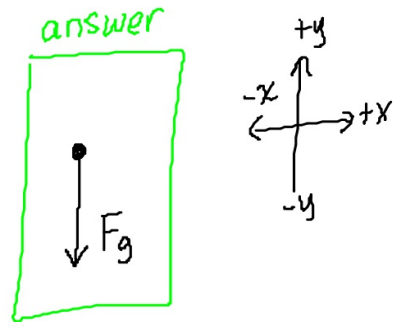
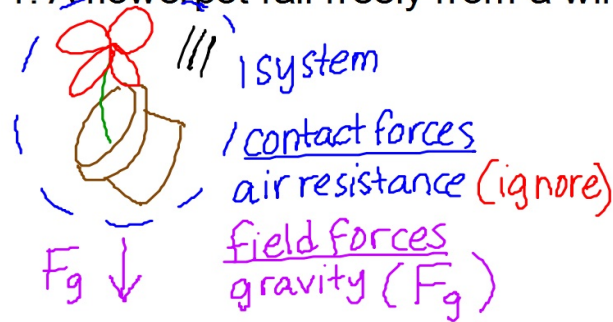
↳ one FBD per object

↳ forces are represented with arrows in direction force is exerted

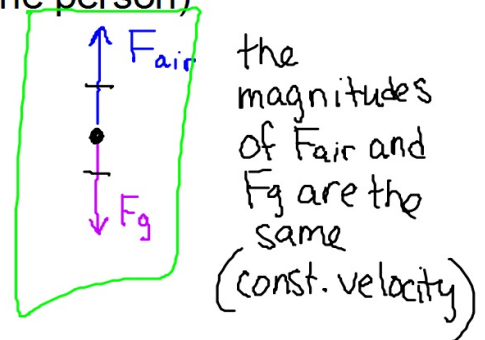
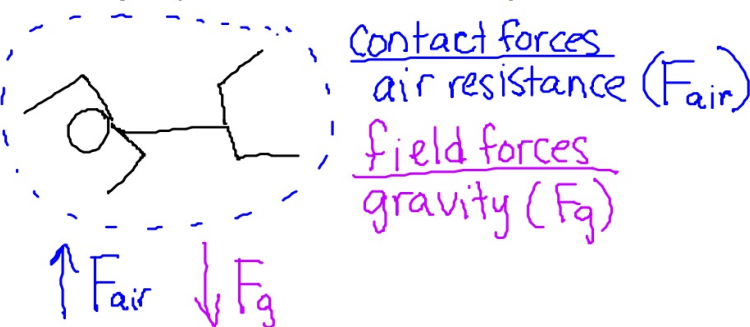
↳ label all of your arrows (vectors)

Practice Problems:

1. A flowerpot fall freely from a windowsill.

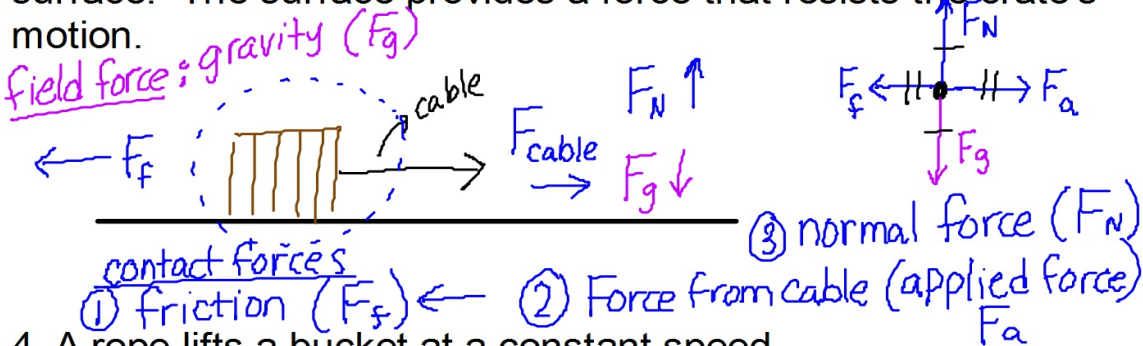


2. A skydiver falls downward through the air at constant velocity. (the air exerts an upward force on the person)

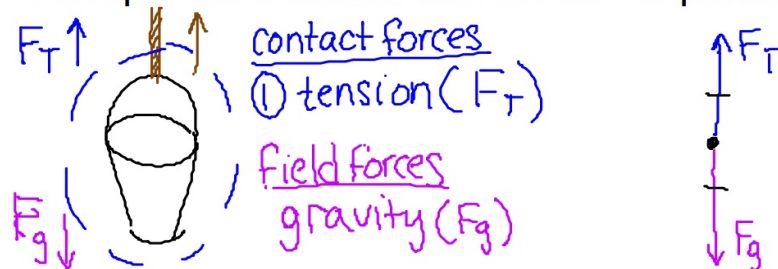


Practice Problems

3. A cable pulls a crate at a constant speed across a horizontal surface. The surface provides a force that resists the crate's motion.

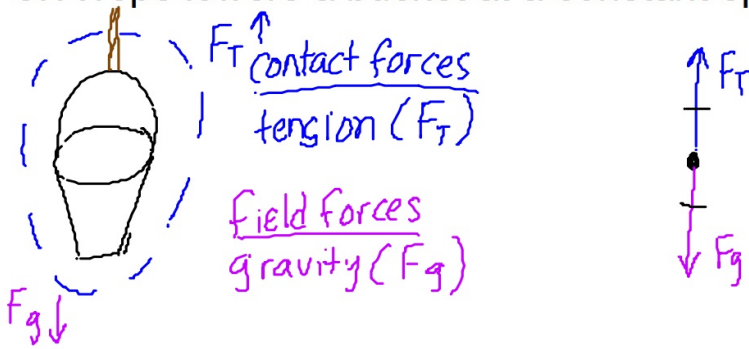


4. A rope lifts a bucket at a constant speed.



Practice Problems

5. A rope lowers a bucket at a constant speed.



Net Force

the vector sum of all the forces acting on an object

$$\bullet F_{\text{net}} = \sum F$$

Newton's Second Law

$$a = \frac{F_{\text{net}}}{m} \quad \text{or} \quad F_{\text{net}} = ma$$