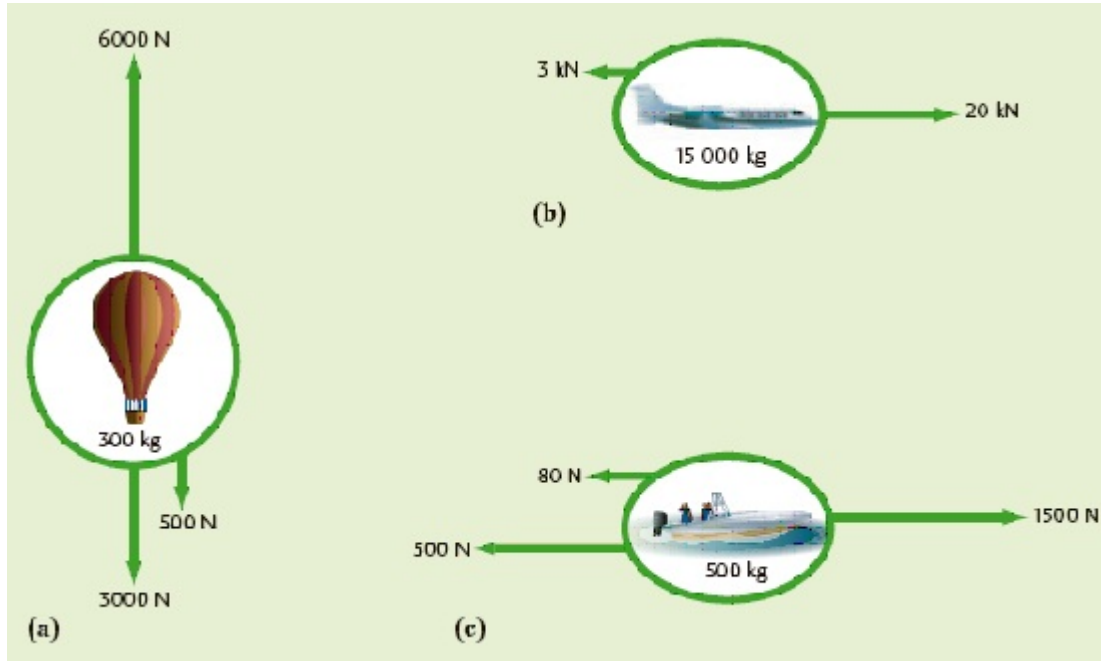
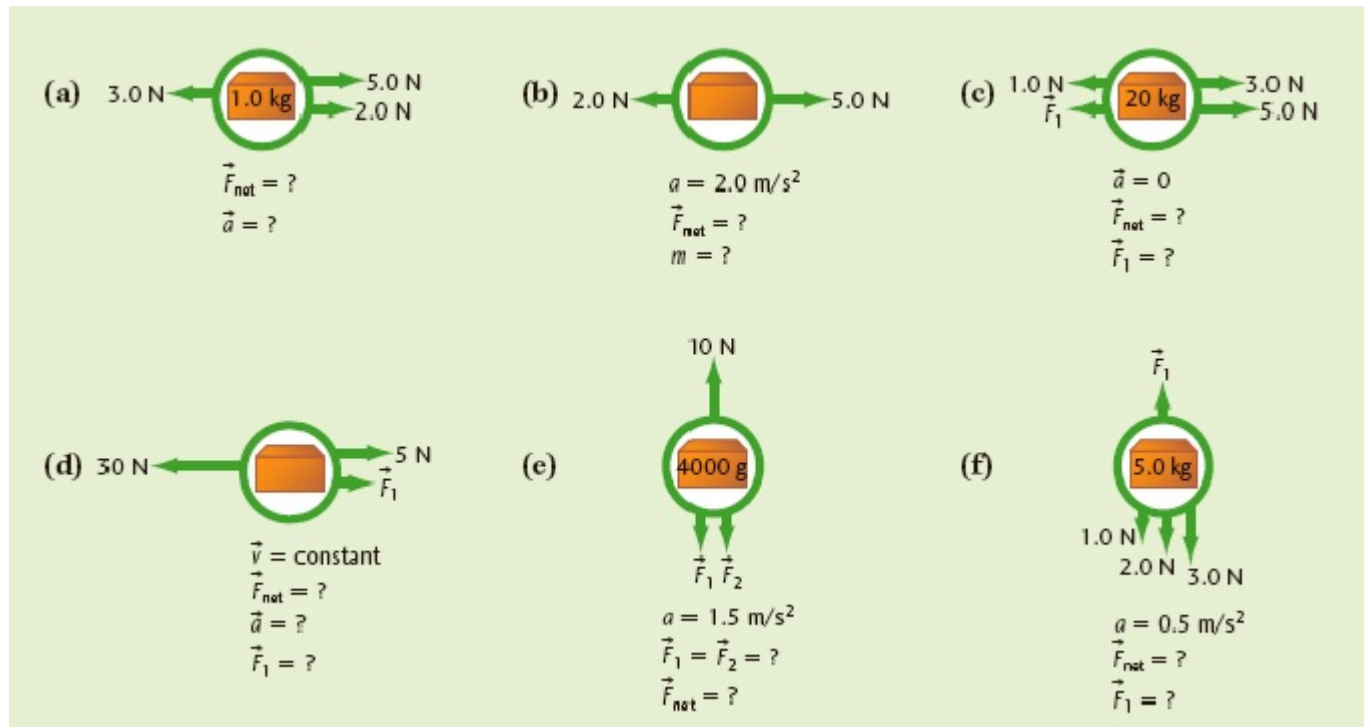


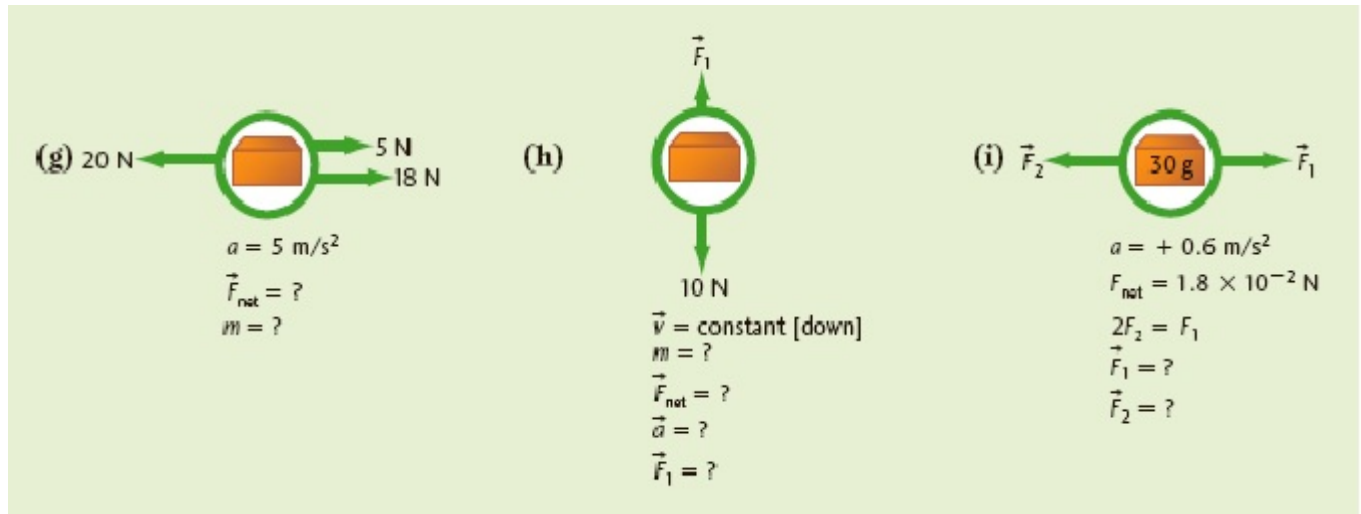
Worksheet 2 - Newton's Second Law Using the FBD Process

1. Find the acceleration in the following FBDs.



2. Find the missing values.





3. A car of mass 2000 kg has a driving force of 4500 N and experiences an air resistance of 1500 N. What is the car's acceleration?
4. Being the good daughter you are, you are cutting the estate lawn with a push mower of mass 12.6 kg. You exert a force of 117 N horizontally, and you experience a frictional force of 45 N due to the mechanism of the machine as well as a resistive force of 58 N due to the grass itself.
 - (a) What is your acceleration?
 - (b) What speed do you reach after 7.0 s of pushing from rest?
5. A plane accelerates horizontally. If the thrust of the engines is increased to $5.0 \times 10^4\text{ N}$ at a time when the air resistance acting on the $4.0 \times 10^3\text{ kg}$ plane is $3.0 \times 10^4\text{ N}$, what will be the plane's acceleration?
6. Two children are arguing over a toy. One pulls with a force of 30.0 N [S] and the other pulls with a force of 32 N [N]. If the toy has a mass of $5.0 \times 10^2\text{ g}$, what will be the resulting acceleration?
7. Calculate the mass of a sled that has an acceleration of 0.78 m/s^2 . A frictional force of 20.0 N is opposing an applied force of 52 N.