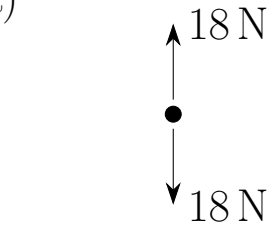
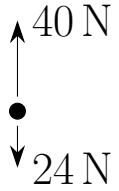
Task #1

In each of the free-body diagrams below, calculate the **magnitude** and **direction** of the net force and draw it.

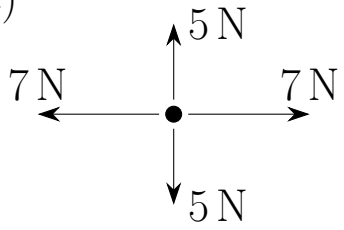
(a)



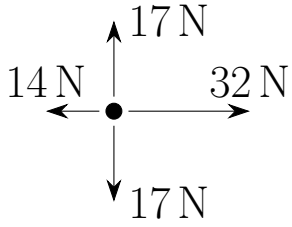
(b)



(c)



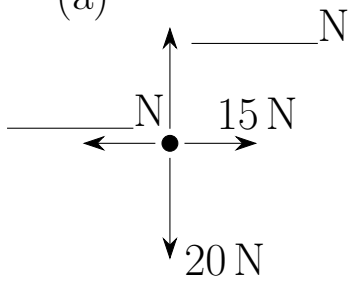
(d)



Task #2

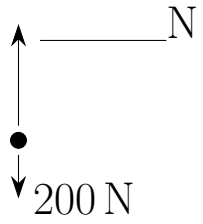
In each of the free-body diagrams below, the net force is given, but one or more of the applied forces is missing. Find the missing forces.

(a)



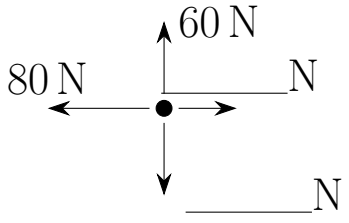
$\Sigma\vec{F} = 0\,\text{N}$

(b)



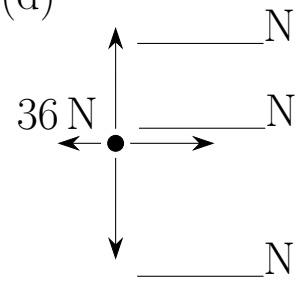
$\Sigma\vec{F} = 150\,\text{N}$, up

(c)



$\Sigma\vec{F} = 45\,\text{N}$, left

(d)

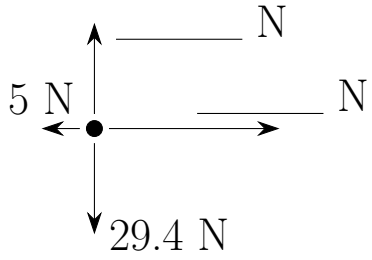


$\Sigma\vec{F} = 23\,\text{N}$, right

Task #3

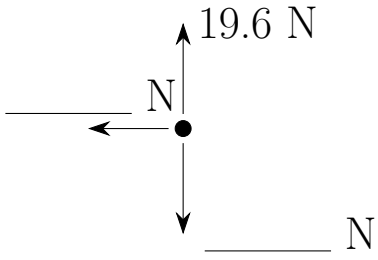
Fill in the blanks in each of the situations depicted below. Draw the net force.

(a)



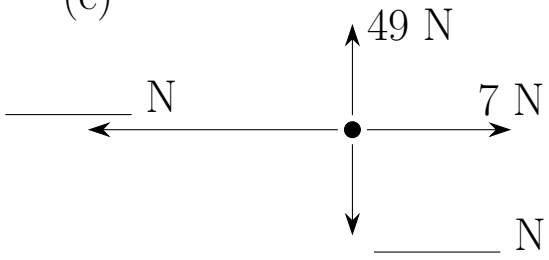
$m =$ 3 kg
$a =$ _____ m/s^2, _____
$\Sigma\vec{F} =$ 23 N, right

(b)



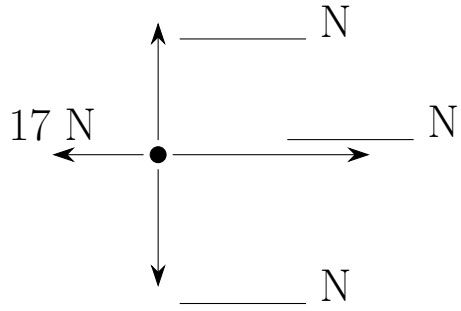
$m =$ 2 kg
$a =$ 8 m/s^2, left
$\Sigma\vec{F} =$ _____ N, _____

(c)



$m =$ 5 kg
$a =$ 12 m/s^2, left
$\Sigma\vec{F} =$ _____ N, _____

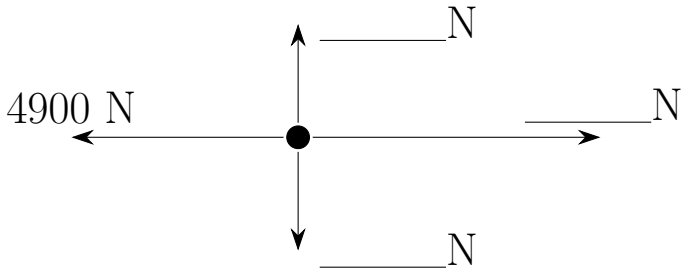
(d)



$m =$ 3 kg
$a =$ 18 m/s^2, right
$\Sigma\vec{F} =$ _____ N, _____

Task #4

A 900-kg car accelerates from rest to 45 m/s in 6.8 seconds. Fill in the free-body diagram below, assuming that the average force against the motion of the car due to air drag and friction is 4900 N.



Task #5

Consider 15,000-kg rocket that is accelerating upward at 18.2 m/s^2. Fill in the forces on the free-body diagram below.