

Name:

Date:

Period:

Net Force and Free-Body Diagrams

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

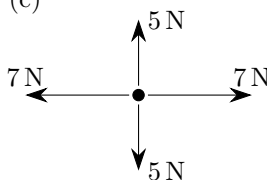
(a)



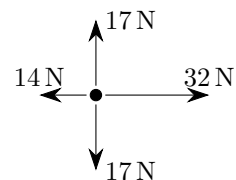
(b)



(c)

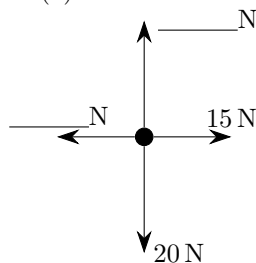


(d)



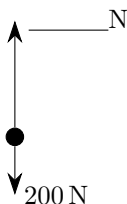
2. In each of the free-body diagrams below, the net force is given, but one or more of the applied forces is missing. Find the missing forces.

(a)



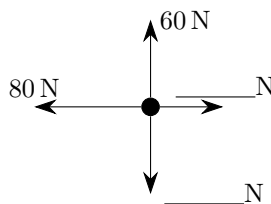
$$\Sigma \vec{F} = 0 \text{ N}$$

(b)



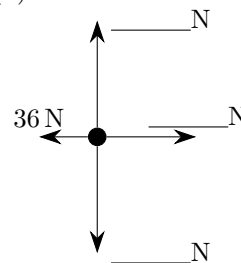
$$\Sigma \vec{F} = 150 \text{ N, up}$$

(c)



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

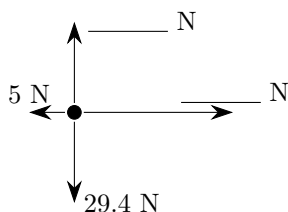
(d)



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

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

(a)

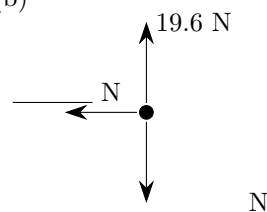


$$m = 3 \text{ kg}$$

$$a = \text{blank m/s}^2, \text{ blank}$$

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

(b)

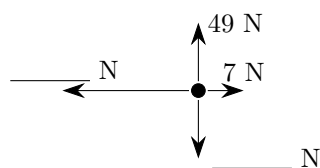


$$m = 2 \text{ kg}$$

$$a = 8 \text{ m/s}^2, \text{ left}$$

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

(c)

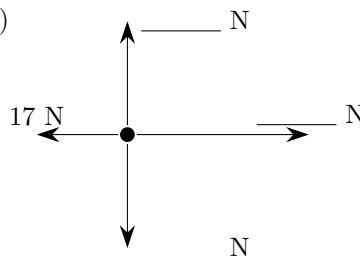


$$m = 5 \text{ kg}$$

$$a = 12 \text{ m/s}^2, \text{ left}$$

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

(d)



$$m = 3 \text{ kg}$$

$$a = 18 \text{ m/s}^2, \text{ right}$$

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

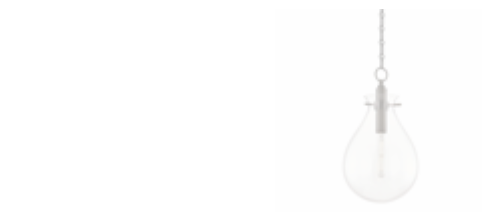
Name: _____

Date: _____

Period: _____

4. For each of the sketches below, identify all the forces applied on all objects and draw a free body diagram. Then come up with an expression for the net force.

(a) Lamp hanging from a chain



(d) A box being pushed forward on the ground (constant speed)



(b) A car moving at a constant speed.



(e) A skydiver before opening her parachute



(c) A car accelerating



(f) Object sliding down an inclined plane.

