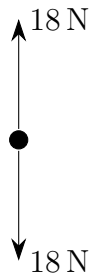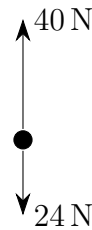# Net Force Examples

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

(a)

18 N
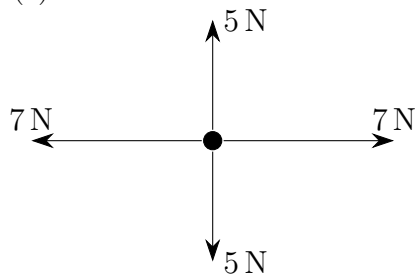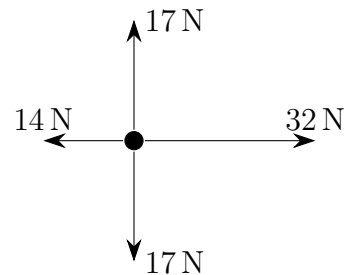
18 N

$F_{NET} =$ _____ N, _____

(b)

40 N

24 N

$F_{NET} =$ _____ N, _____

(c)

5 N

7 N   7 N

5 N
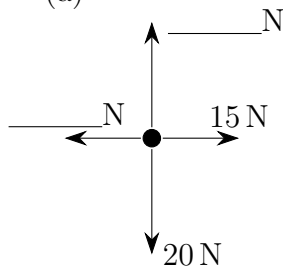
$F_{NET} =$ _____ N, _____

(d)

17 N

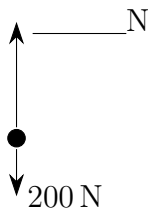14 N   32 N

17 N

$F_{NET} =$ _____ N, _____

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.
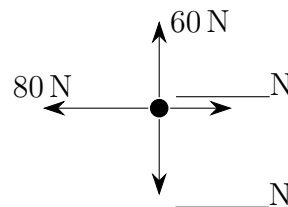
(a)

_____ N

_____ N   15 N
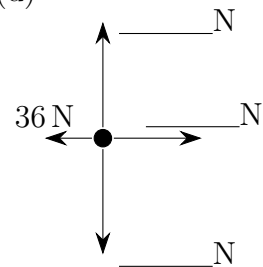
20 N

$F_{NET} = 0$ N

(b)

_____ N

200 N

$F_{NET} = 300$ N, up

(c)

60 N

80 N   _____ N

_____ N

$F_{NET} = 45$ N, left

(d)

_____ N

36 N   _____ N

_____ N

$F_{NET} = 23$ N, right
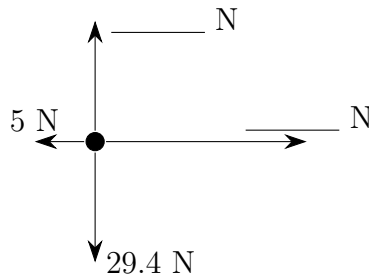
3. What is the acceleration of a 1500-kg car that experiences a net force of 970 N?

4. Fill in the blanks in each of the situations depicted below. Draw the net force.
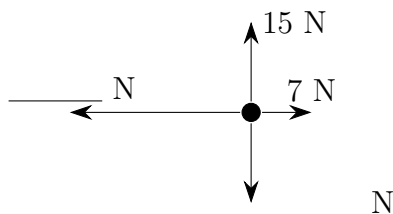
(a)
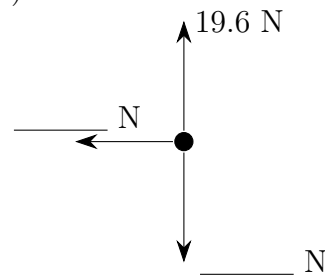
_____ N (up)

5 N (left)   _____ N (right)

29.4 N (down)

$m =$ 3 kg
$a =$ _____ m/s²
$F_{NET} =$ 23 N, right

(b)

19.6 N (up)

_____ N (left)

_____ N (down)

$m =$ 2 kg
$a =$ 8 m/s², left
$F_{NET} =$ _____ N, _____

(c)

15 N (up)

_____ N (left)   7 N (right)

_____ N (down)

$m =$ 5 kg
$a =$ 12 m/s²
$F_{NET} =$ _____ N, _____

(d)

_____ N (up)

17 N (left)   _____ N (right)

_____ N (down)
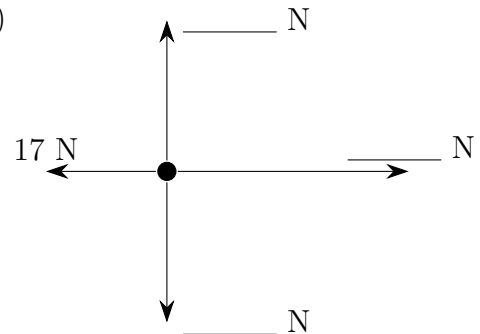
$m =$ 3 kg
$a =$ 18 m/s²
$F_{NET} =$ _____ N, _____

5. An airplane has a mass of 2500 kg. It needs to get up to a speed of 30 m/s in order to take off. How much net force is needed to get the plane from rest up to this speed on a 245 m runway? (Hint: *Begin by finding acceleration!*)