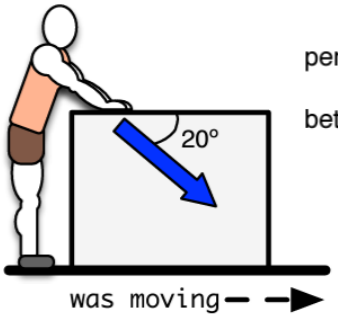
Cycle 4 – Advanced Components

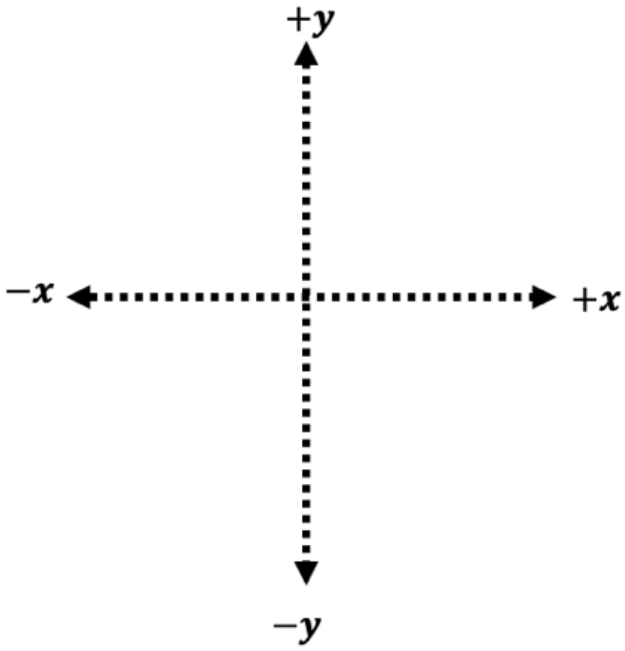
Check-in #3

Name: _____



The box weighs 400 N. The person pushes with a force of 300 N. The coefficient of friction between the box and floor is 0.40.

a.) Draw and label all force on the diagram, including components.
b.) Find the normal force.
c.) Find the Force of Friction
d.) Find the net force in the x-direction.



Forces	x	y
F_{Net}		

Fnet in the x

☐ gaining speed.
☐ constant speed.
☐ losing speed.

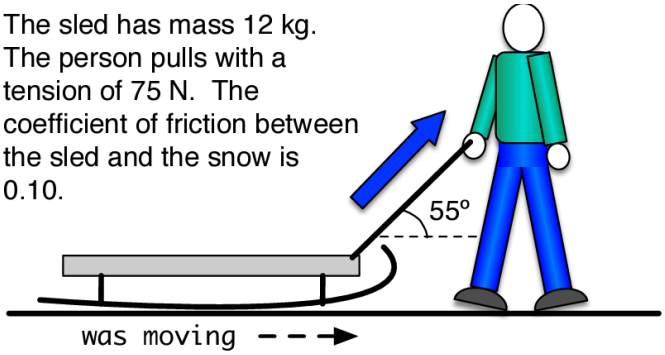
Fnet in the y

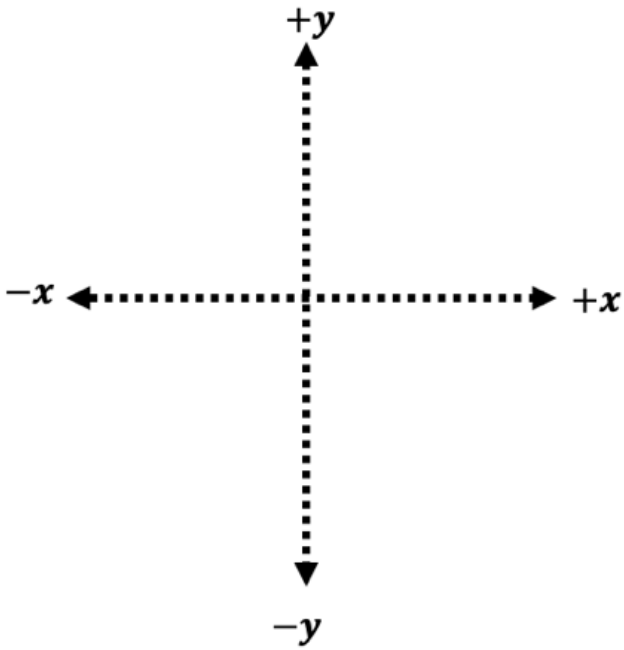
☐ gaining speed.
☐ constant speed.
☐ losing speed.

Cycle 4 – Advanced Components

Check-in #3

The sled has mass 12 kg. The person pulls with a tension of 75 N. The coefficient of friction between the sled and the snow is 0.10.





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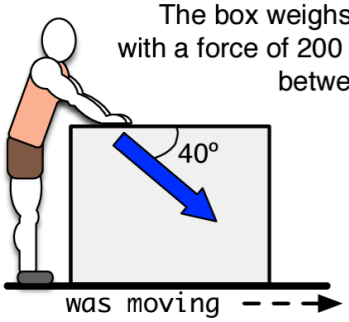
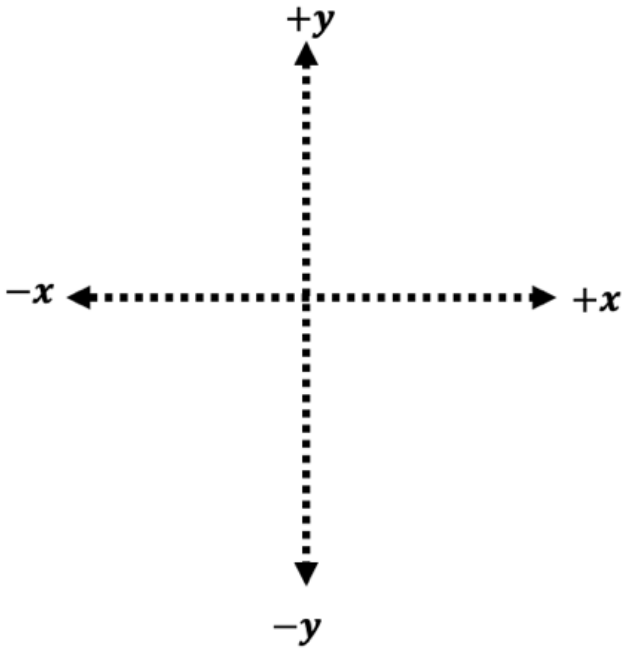


The box weighs 300 N. The person pushes with a force of 200 N. The coefficient of friction between the box and floor is 0.50.



This box will only be moving right or left, NOT up or down!

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d.) Find the net force in the x-direction.

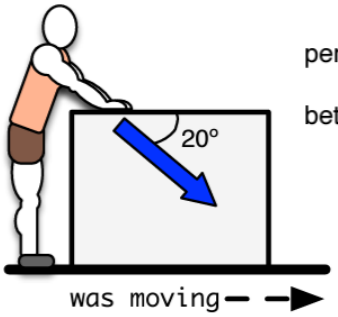
Forces	x	y
F_{Net}		

Fnet in the x

☐ gaining speed.
☐ constant speed.
☐ losing speed.

Fnet in the y

☐ gaining speed.
☐ constant speed.
☐ losing speed.



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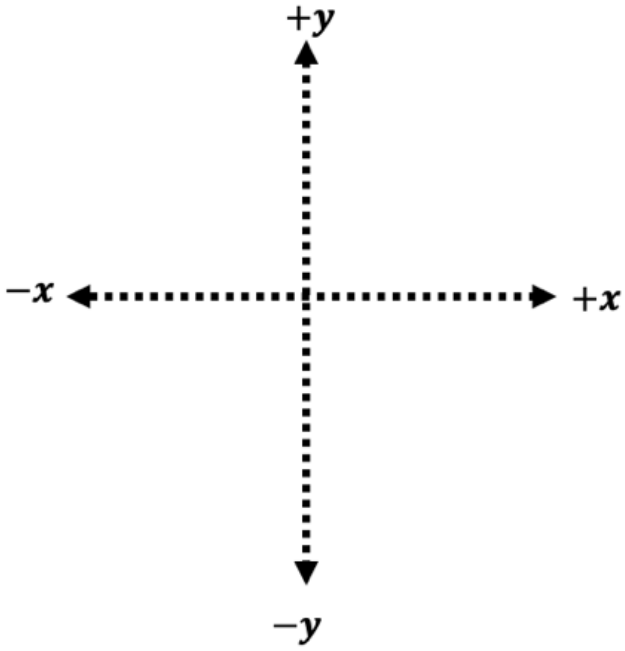

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Forces	x	y
F_{Net}		

Fnet in the x

☐ gaining speed.
☐ constant speed.
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Fnet in the y

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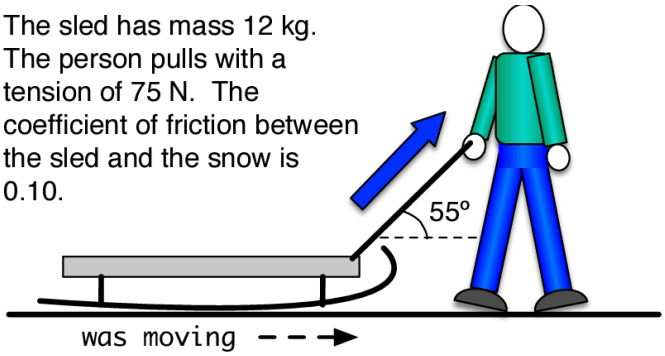

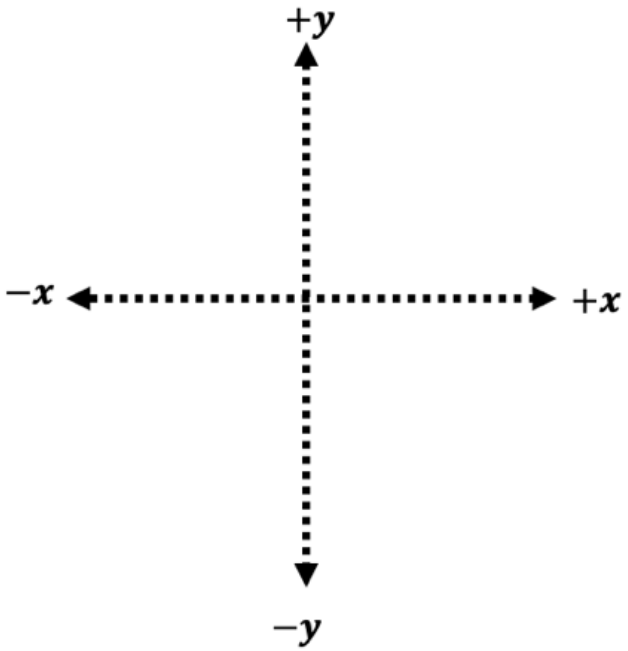

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Forces	x	y
F_{Net}		

Fnet in the x

☐ gaining speed.
☐ constant speed.
☐ losing speed.

Fnet in the y

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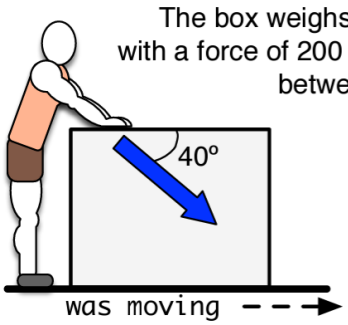
☐ constant speed.
☐ losing speed.



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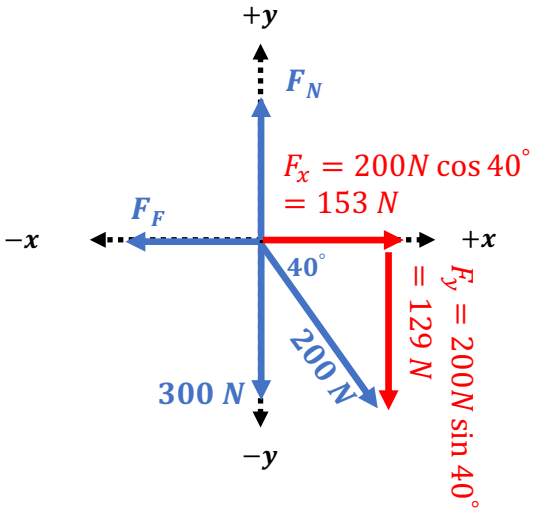


a.) Draw and label all force on the diagram, including components.
b.) Find the normal force.
c.) Find the Force of Friction
d.) Find the net force in the x-direction.

Fnet in the x
-62 N

- ☐ gaining speed.
- ☐ constant speed.
- ☒ losing speed.

Fnet in the y
0

- ☐ gaining speed.
- ☒ constant speed.
- ☐ losing speed.

b.) Since the normal force must cancel out both the y-component and the weight:

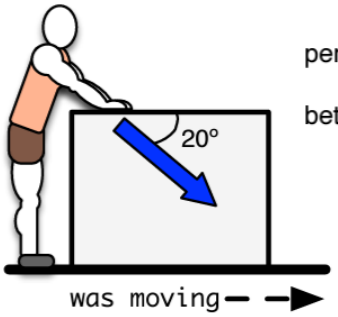
$$F_N = 300\ N + 129\ N = 429\ N$$

c.)

$$F_f = (0.5) * 429\ N = 215\ N$$

d.)

$$F_{Net} = F_x - F_f = 153\ N - 215\ N = -62\ N$$



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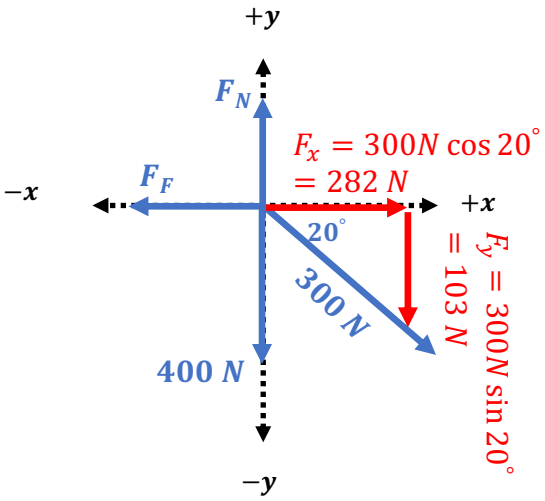


b.) Since the normal force must cancel out both the y-component and the weight:

$$F_N = 400\ N + 103\ N = 503\ N$$

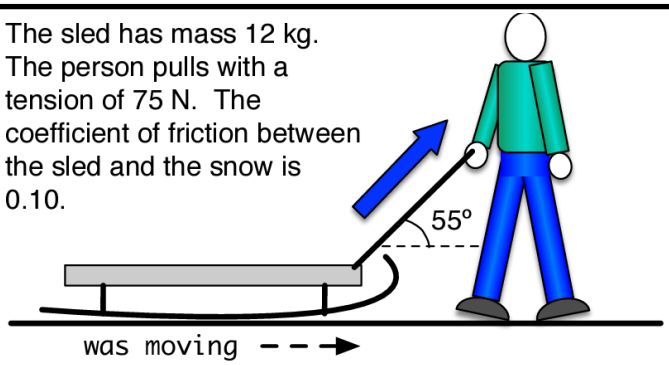
c.)

$$F_f = (0.4) * 503\ N = 201\ N$$

d.)

$$F_{Net} = F_x - F_f = 282\ N - 201\ N = +81\ N$$

Fnet in the x	Fnet in the y
+81 N	0
☒ gaining speed. ☐ constant speed. ☐ losing speed.	☐ gaining speed. ☒ constant speed. ☐ losing speed.



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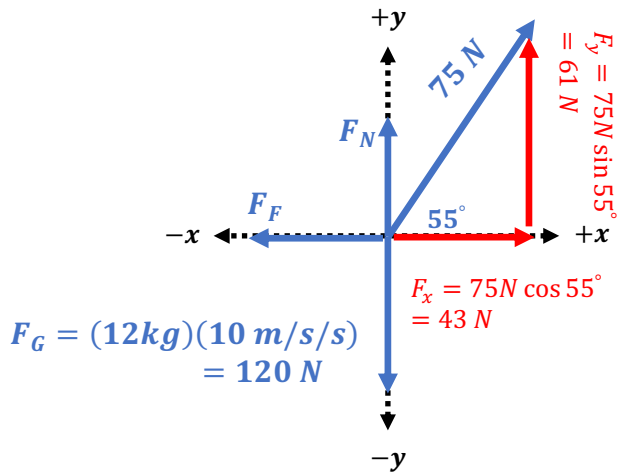

b.) Since the normal force and the y-component together cancel the weight:

$$F_N + 61N = 120\ N$$
$$F_N = 59\ N$$

c.)

$$F_f = (0.1) * 59\ N = 6\ N$$

d.)

$$F_{Net} = F_x - F_f = 43\ N - 6\ N = +37\ N$$

Fnet in the x	Fnet in the y
+37 N	0
☒ gaining speed. ☐ constant speed. ☐ losing speed.	☐ gaining speed. ☒ constant speed. ☐ losing speed.