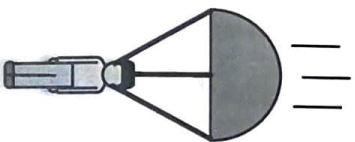


Cycle 5 - 2nd Law

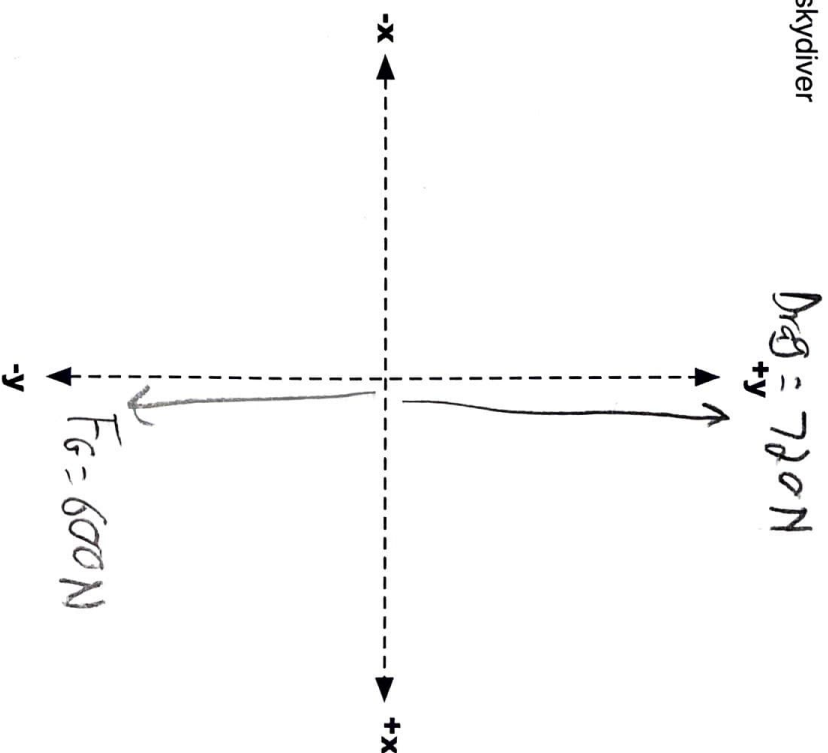
Review



1. The skydiver (mass 60 kg) experiences 720 N of Drag. The skydiver is initially falling with a speed of 20 m/s
- a) Put the forces on the diagram & find the net force.
- b) Calculate the acceleration.
- c) Fill in the table below.

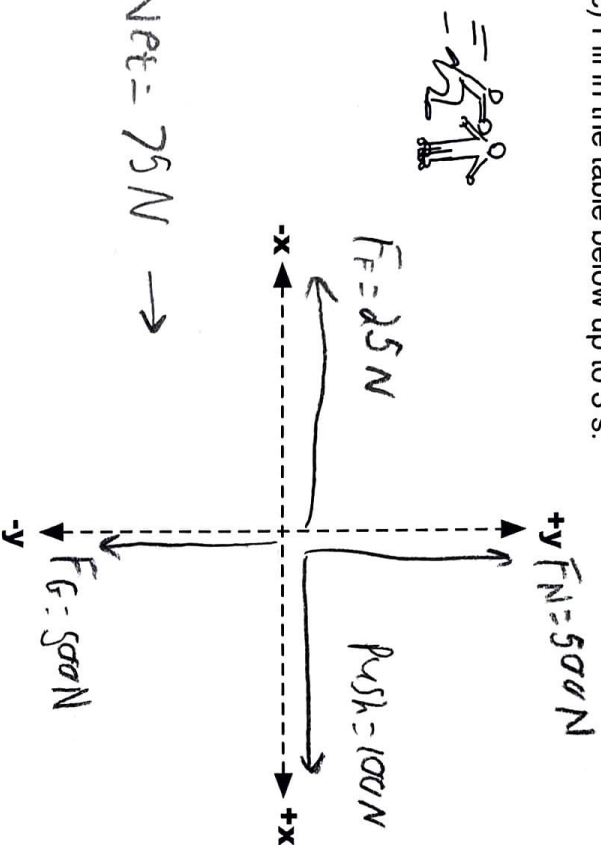
$$F_{\text{net}} = 120 \text{ N} \uparrow$$

$$\text{acceleration} = \frac{120 \text{ N}}{60 \text{ kg}} = +2 \text{ m/s}^2$$



Speed at $t = 0$	Speed at $t = 1 \text{ s}$	Speed at $t = 2 \text{ s}$	Speed at $t = 3 \text{ s}$	Speed at $t = 4 \text{ s}$
-20 m/s	-18 m/s	-16 m/s	-14 m/s	-12 m/s

- Dino pushes 50 kg Gina on an old pair of roller skates with a force of 100 N. There is 25 N of friction due to the squeaky old wheels of the skates. They start from a speed of 1 m/s.
- Put the forces on the diagram & find the net force.
 - Calculate the speed change factor.
 - Fill in the table below up to 3 s.



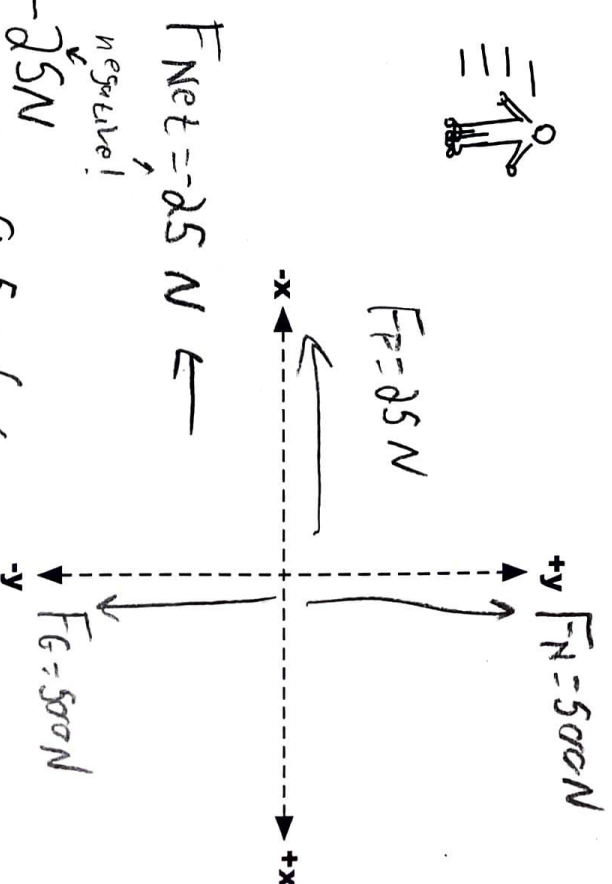
$$\frac{F_{\text{Net}}}{\text{mass}} = a$$

$$\frac{75\text{ N}}{50\text{ kg}} = 1.5\text{ m/s}^2$$

Speed up rate

Speed at $t = 0$	Speed at $t = 1\text{ s}$	Speed at $t = 2\text{ s}$	Speed at $t = 3\text{ s}$	Speed at $t = 4\text{ s}$	Speed at $t = 5\text{ s}$	Speed at $t = 6\text{ s}$	Speed at $t = 7\text{ s}$
1 m/s	2.5 m/s	4 m/s	5.5 m/s	5 m/s	4.5 m/s	4 m/s	3.5 m/s

- Then after $t = 3\text{ s}$, Dino stops pushing, and Gina continues with only the friction force in the x-direction.
- Put the forces on the diagram & find the net force.
 - Calculate the speed change factor.
 - Fill in the rest of the table.



$$\frac{-25\text{ N}}{50\text{ kg}} = -0.5\text{ m/s}^2$$

Slow down rate