Net Force

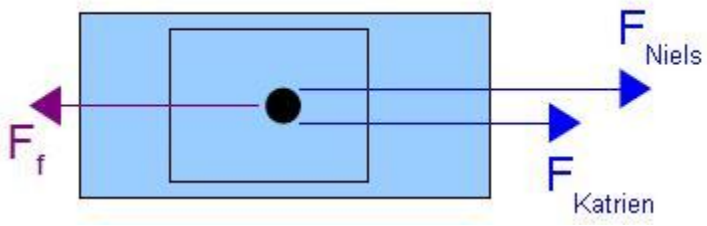
The net force is the vector sum of all the forces acting on an object.
● If the forces are parallel we can just add them together as positive and negative forces.
● If the forces are at an angle we have to add them as components of vectors (i.e. break them down into horizontal and vertical forces).

When someone talks about "gross pay" and "net pay", what do they mean? Gross pay is how much you are paid before any deductions. Net pay is how much you actually get on your paycheck after all the deductions. It's the same sort of thing when we examine net force. After you have added and subtracted all the forces you are left with the net force acting on the object.

Example 1

A car is stuck in a snow drift. Niels and Katrien attach two ropes to the vehicle and try to pull it out by pulling in the same direction. Niels pulls with a force of 75N while Katrien pulls with a force of 68N. There is a force due to friction of 40N acting on the car. Sketch a free body diagram of the situation and determine the net force acting on the car.

We'll begin by sketching a free body diagram looking down on the car (top view).
● Notice how Niels and Katrien and both pulling in the same direction, parallel to each other. Since they are pulling to the right, we will call these two forces positive.
● Friction is acting against them in the exact the opposite direction. We will call this force negative.



● To determine the net force, we will need to write out a formula.
● Net force will be equal to all the forces from the free body diagram added together.

$$F_{NET} = F_{Niels} + F_{Katrien} + F_f$$
$$F_{NET} = 75N + 68N + (-40N)$$
$$F_{NET} = 103N$$

The net force is 103 N acting to the right.