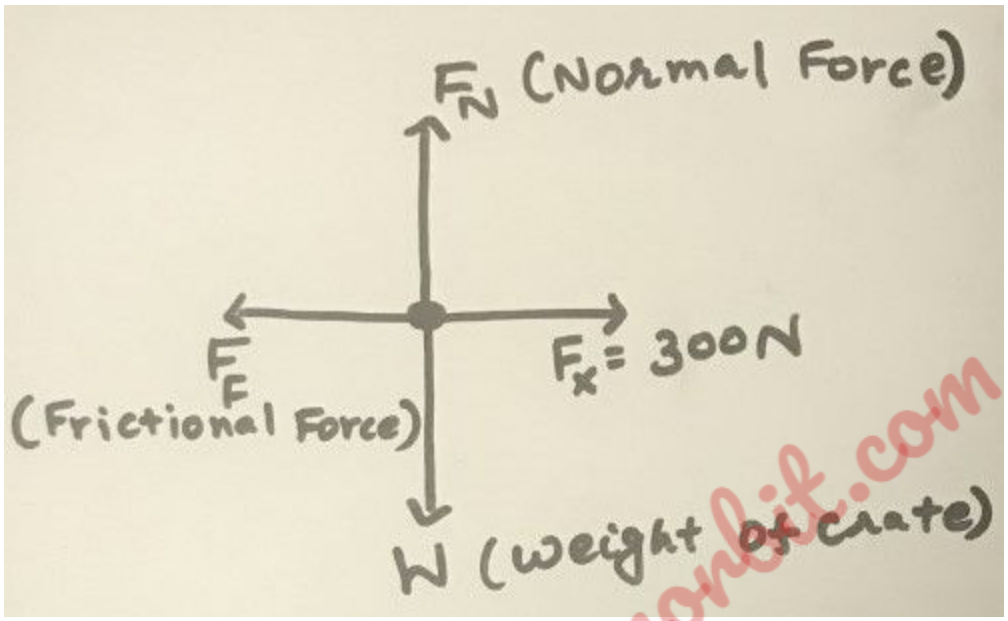
A large crate experiencing an external force of 300 N, along the positive X-direction, is moving across the floor in the horizontal direction with a constant velocity. There is a force of friction acting between the floor and the crate.

a) Draw and label all the forces acting on the crate.



b) Calculate the force of friction acting between the crate and the floor.

Given:

External force on the crate in positive X-direction

$F_x = 300$ N

Also, since the crate is moving at a constant velocity in the horizontal direction, acceleration "a" and hence net force "F" acting on the crate is zero.

$a = 0$ m/s^2

$F = ma = F_x - F_F = 0$ N

Determine: Frictional force F_F:

Net force along X-direction:

$F = F_x - F_F$ ----------(1)

Substituting for F and F_x in (1):

$F_F = 300$ N

N is Newtons, the unit of force.
1 N = 1 kg m / s^2.