

Newton's 2nd Law (cont'd)

If we are applying a force to an object and there is a frictional force against its motion, the net force is found by:

$$F_{\text{NET}} = F_a + F_f$$

ex.

What is the acceleration of a 2 kg object if it has an applied force of 30 N to the right and a frictional force of 20 N acting on it?

*If only a friction or braking force is acting on an object and slowing it down, the net force and acceleration will be negative.

ex.

A 1000 kg car is moving at 30 m/s and brought to rest in 25 seconds. What is the frictional (braking) force that is stopping the car?

*If an object is moving at constant velocity, there are balanced forces. (This often means that F_a is equal and opposite F_f .)

ex.

A 50 kg baby carriage is being pushed along a rough sidewalk with an applied force of 200 N to the right. It has a constant velocity of 3 m/s to the right.

a.) What other horizontal force is acting on the carriage and what is the magnitude and direction of the force?

b.) What applied force would have been required to accelerate the carriage from rest to the 5 m/s [R] in 2 seconds assuming that friction would remain the same?