**A box of mass 50kg is pulled up from the hold of a ship with an acceleration of 1m/s2 by a vertical rope attached to it. Find the tension in the rope what is the tension in the rope when the box moves up with a uniform velocity of 1m/s.**

Second Newton's law:

$$T - F_g = Ma$$

$$T = F_g + Ma = Mg + Ma = M(g + a)$$

$$T = 50kg * (9.8m/s^2 + 1m/s^2) = 540N$$

If the box moves with uniform **velocity**, the rope tension is equal to the box's weight at rest:

$$T = Mg = 50kg * 9.8m/s^2 = 490N$$