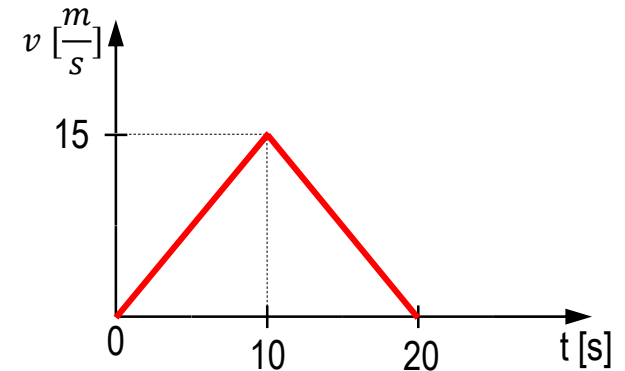


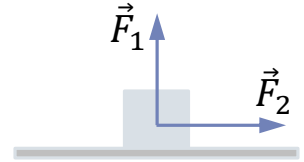
## PROBLEMS

1. A car speeds up from  $12\text{m/s}$  to  $20\text{m/s}$  in  $6,4\text{s}$ . If its mass is  $1200\text{kg}$ , what force must its engine provide?
2. A train with a mass of  $500\text{t}$  is uniformly retarded by applying its brake. Its velocity drops from  $60\text{km/h}$  to  $20\text{km/h}$  in  $25$  seconds. Find the braking force.
3. An automobile of mass  $2000\text{kg}$  moving at  $30\text{m/s}$  is braked suddenly with a constant breaking force of  $10000\text{N}$ . How far does the car travel before stopping?
4. An initially stationary electron ( $m_e = 9,1 \cdot 10^{-31}\text{kg}$ ) undergoes a constant acceleration through  $2\text{cm}$  reaching  $4 \cdot 10^6\text{ m/s}$ . What is the magnitude of the force accelerating the electron?
5. A force produces an acceleration of  $10\text{m/s}^2$  in a body of mass  $m_1$ , and the same force produces an acceleration of  $2\text{m/s}^2$  in another body of mass  $m_2$ . If the same force is applied to  $m_1 + m_2$  then the acceleration will be?
6. Graph shows the variation of the velocity of a moving object ( $m=1200\text{kg}$ ) with time. Draw the graph showing the variation of the force with time.



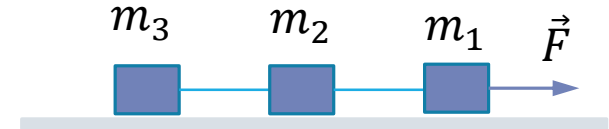
7. A crane is used to hoist a load of mass 500kg. The load is suspended by a cable. The load is lifted upward with constant acceleration  $0,5m/s^2$ . Find the tension force in the cable.

8. Two forces  $F_1 = 3N$  and  $F_2 = 4N$  act a 0,5 kg object. Find the acceleration of the object? Friction is negligible.



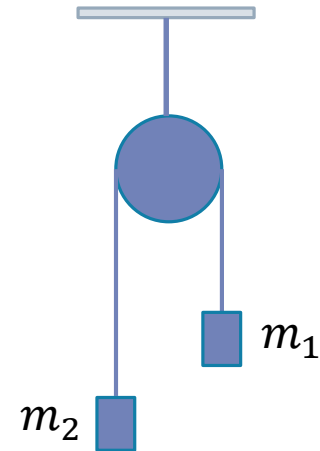
9. Three connected blocks are pulled to the right on a horizontal frictionless table by a force of magnitude  $F=12N$ . If  $m_1 = 1kg$ ,  $m_2 = 2kg$ ,  $m_3 = 3kg$  calculate:

- the magnitude of the systems acceleration
- the tension force  $T_1$
- the tension force  $T_2$

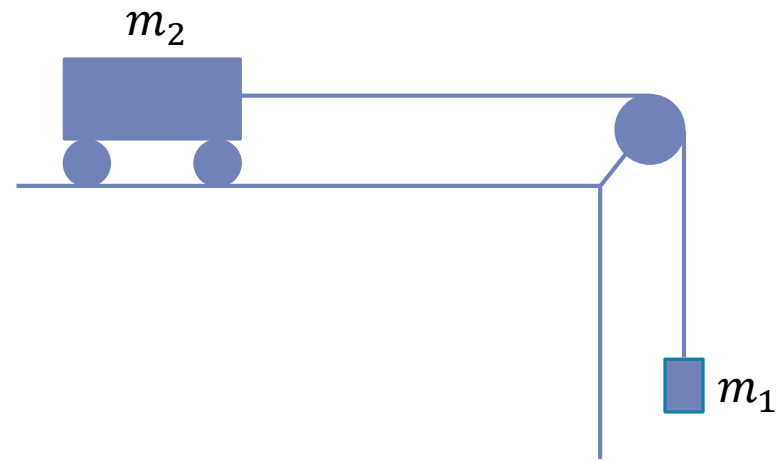


10. Picture shows two blocks connected by a cord (of negligible mass) that pass over a frictionless pulley (also of negligible mass). One block has mass  $m_1 = 10g$ , other has mass  $m_2 = 30g$ . Calculate:

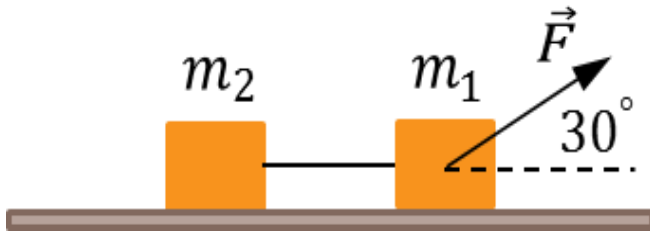
- the magnitude of the blocks acceleration
- the tension force in the cord



11. In picture, cart of mass  $m_2 = 100g$ , and block of mass  $m_1 = 20g$ , are connected with cord. When the system is released from rest, calculate:
- the magnitude of the system acceleration
  - the tension force in the cord
- Negligible friction at its axle and negligible the mass of cord.



12. Two connected blocks are pulled to the right on a horizontal frictionless table by a force of magnitude  $F = 1.73N$  (picture). If  $m_1 = 1kg$ ,  $m_2 = 2kg$ , calculate:
- the magnitude of the system's acceleration
  - the tension force



13. A bar is moving downward along a  $2.82m$  long frictionless incline plane with a slope  $45^\circ$ . If the bar starts from rest, what will be the bar's velocity when it reaches the bottom of the plane?