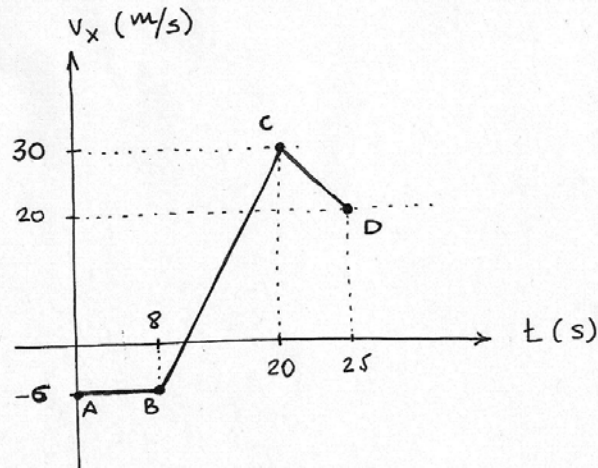


Exam: KINEMATICS

Name:

Course:

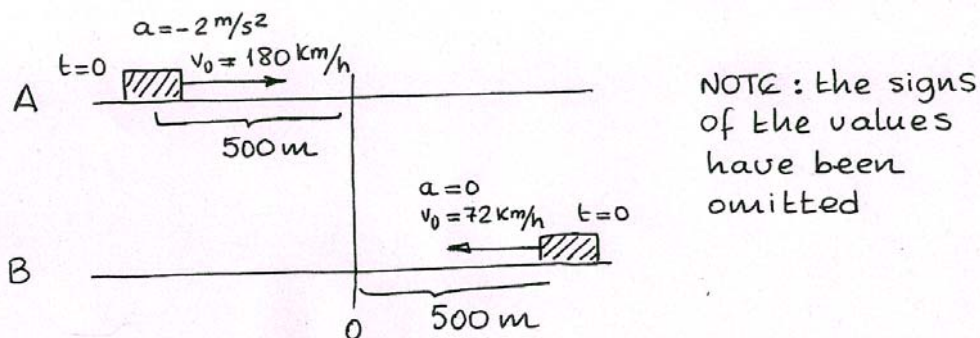
- ① The initial position vector of a body is $\vec{r}_0 = -18\vec{i}$ (m) and its motion is described in the following $v-t$ graph:



Determine

- the type of motion in each interval [0.25]
- the value of acceleration in each interval [0.75]
- the moment (time) in which the body [0.25] changes the direction of motion
- the displacement in those 25 s [0.75]
- the position of the body when $t = 20$ s [0.50]

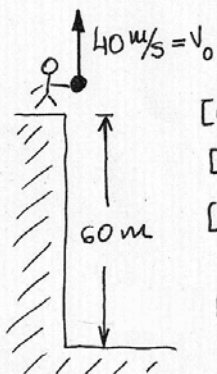
- ② The initial conditions of two bodies (A and B) are described in the picture below.



Determine

- the equations of the position vectors (\vec{r}_A and \vec{r}_B) [0.50]
- the moment (time) and location (position) the first time they pass each other [0.50]
- the moment (time) when A changes its direction of motion [0.50]
- the distance between them when $t = 12$ s [0.50]
- the velocity of A when it crosses the origin towards the left [0.50]

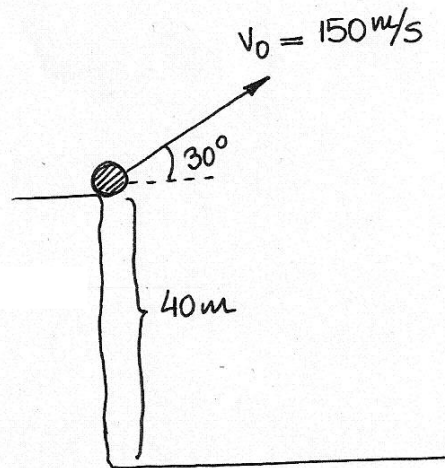
- ③ A ball is thrown upwards as described in the picture.



Determine:

- [0.75] the equation of the position vector
- [0.50] the equation of the velocity
- [0.75] the maximum height for the body
- [0.50] the velocity when the body hits the floor

- ④ A ball is launched as described in the picture.



Determine:

- the components of initial velocity [0.50]
- the equation of the position vector [0.50]
- the equation of the velocity [0.50]
- the maximum height reached [0.50]
- the horizontal position when the ball hits the floor [0.50]