

Phys 201 worksheet. Lecture 9.

Q1. For a block A, whose mass is M_1 , the position at some instant is given by the equation below:

$$-5.58 m = 0.3m - 1.7 \frac{m}{s} \times (t_2 - 0.7s) + (X_1 - 4.9 \frac{m}{s^2} \times \sin(30^\circ)) \times (t_2 - 0.7s)^2$$

This is an equation to find of the position at any moment for a motion of constant acceleration. In this equation, the initial velocity of the block is _____, which happens at a time of _____.

t_2 in the equation above is _____.

The position of the block at the current moment is _____.

The acceleration is _____.

$2 \times X_1 \times M_1$ will be in the unit of _____. Let's call it T_1 from now on.

What is the physical situation of this question? Please also draw the free body diagram for the block below. Please also mark out the T_1 .

The mass of block A is _____.

Q2. For a block B, whose mass is M_2 , the velocity at some instant (not necessary the same as above question) is given by the equation below:

$$v_{t=2.6s} = 0 \frac{m}{s} + \frac{(T_1 - T_2 - \mu \times 0.7kg \times 9.8 \frac{m}{s^2})}{0.7kg} \times (2.6s - 0s)$$

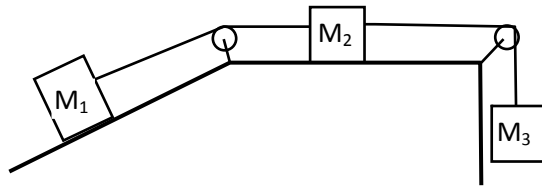
The initial velocity of the block is _____, which happens at a time of _____.

The mass of block B is _____.

The total force on block B is the expression of _____.

What is the physical situation of this question? Please also draw the free body diagram for the block B below.

If three blocks, A, B and C are linked together as in the graph below, continue with all the information you have figured out on previous page,



The angle of the incline is _____ degrees.

If the mass block C has a mass of 0.1 kg. There's no friction on the incline surface, and the only friction is on the flat surface, whose coefficient of friction is 0.2. What equation sets can you get so that all the three blocks can have identical acceleration. Please list your simultaneous equations below.

Q3. Please setup all your equations.

Q4. Please solve your equations out at home, which is your next homework assignment due by Friday, June, 5. Please list your findings:

The acceleration of the system is _____ m/s^2

$T_1 =$ _____ N.

$T_2 =$ _____ N.

$t_2 =$ _____ in unit of _____.

The unknown velocity at $t=2.6s$ is _____.