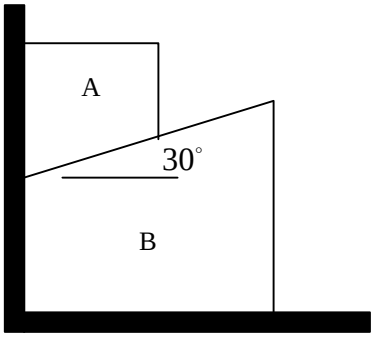
Example Problem - Le 02

Known : The two blocks shown have very smooth surfaces. They are held in the configuration shown and at time zero are suddenly released.

Find : What is the initial acceleration of each block?



Given : The mass of block A is 20 kg and the mass of block B is 50 kg. Friction can be neglected.

Strategy : We want to use the rate form of the *conservation of linear momentum principle*. This form will have the desired acceleration terms and the applied forces of weight and the wall/floor reactions. The big question is what to choose as the system: both blocks together or each block separately? Unfortunately, the answer is not readily obvious. If we consider the two blocks together, there is no easy way to inform our model that there is no friction between them. We therefore need to examine both blocks separately, being sure to remember that the contact force between the blocks is perpendicular to the contact surface *and* equal and opposite. Having applied the kinetic equations, we may need to use the kinematic relationship of relative acceleration to get enough equations to solve for our unknowns.