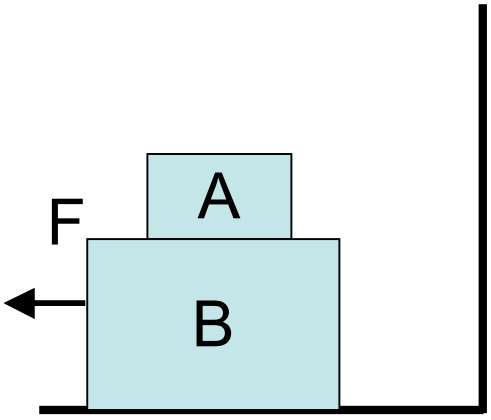
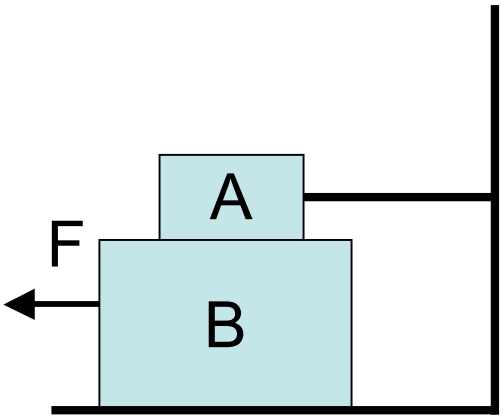
Part II. Answer both questions, 20 points each. Partial credit will be given *only* if the work done is *clear and correct*.

1a. In the figure the mass A weighs 1.2 N, and the mass B weighs 3.60 N. The coefficient of kinetic friction between **all** the surfaces is 0.300 . What is the magnitude of the horizontal force F needed to move blocks A and B together with the same constant speed (Hint: Since A is at rest with respect to B, there is no friction force between A and B when A and B are moving together at constant speed.) (12 points)?



1b. Block A is now fixed by a cord attached to the wall on the right. What is the magnitude of the horizontal force F needed to move block B at constant speed, while block A remains at rest with respect to the table but not with respect to B (8 points)?



Part II. Answer both questions, 20 points each. Partial credit will be given *only* if the work done is *clear and correct*.

2a. A mass of 0.3 kg is on a frictionless, horizontal table. The mass is connected (fixed) to a massless spring which has a force constant of 3.00 N/m. The mass is pushed against the spring such that the spring is compressed to be 10 cm shorter than its natural length, at which point the mass is released. What is the speed of the mass when the spring is 5 cm longer than its natural length (12 points)?

2b. Suppose that there is constant kinetic friction acting between the mass and the table in the part 2a) above, over the 15 cm horizontal distance that the mass travels. How much kinetic friction force would be necessary such that the mass has zero speed when it reaches the position above where the spring is 5 cm longer than its natural length (8 points)?