Name:

PHY 105 Test 2 October 28, 2003 60 minutes La Salle University

Dr. R. DiDio

Do all work in the blue book!

- 1. (**25 pts**) Two crates of mass 80 kg and 210 kg are in contact and at rest on a horizontal surface. A 750 N force is exerted on the 80 kg crate. If the coefficient of static friction is 0.12, calculate
 - a) The acceleration of the system
 - b) The force that each crate exerts on the other



- 2. (15 pts) Tarzan plans to cross a gorge by swinging in an arc from a hanging vine. If his arms are capable of exerting a force of 1400 N on the rope, what is the max speed he can tolerate at the lowest point of the swing? (M = 80 kg, vine = 4.8 m)
- 3. (15 pts) An object moves from x= 0 to x=10 m subject to the following varying force.
 - a) Approximate the total work done on the object during its displacement.
 - b) If the object is 50 kg and has a speed of 10 m/s at x=0, what is its speed at x=10 m?



- 4. (15 pts) Two cages are suspended from a frictionless pulley attached to the roof. While one cage is on the roof, the other cage on the ground is filled with 60 kg of bricks. An 80 kg bricklayer steps into the cage at the roof and rides it 30 m to the ground. Calculate the net work of gravity on the system of cages, bricks, bricklayers, and pulley during this ride.
- 5. (30 pts) Three blocks of mass m_1 , m_2 , and m_3 move downward with acceleration **a**
 - a) What is the tension in the line connected to the top of box 1?
 - b) Determine the tension between block 1 and 2
 - c) Determine the tension between block 2 and 3

