Quiz #2

Monday 24 September 2001 (25 minutes)

The box has a mass of 1 kg and is being towed by a string which is always directed at 30° from the horizontal as shown. The coefficients of static and kinetic friction between the box and the ground are identical: $\mu = (\sqrt{3})/4$. The towing force is a function of time: $T = 1.96t$ Newtons.

1. (10 points) Determine the time instant t_1 at which the box starts to move.
2. (10 points) What is the acceleration of the box at the time instant $t_2 = 4$ seconds?
3. (10 points) What is the velocity of the box at the instant t_2?
4. (10 points) What is the distance the box has traveled up to the instant t_2?