Answer each of the following on a separate sheet of loose leaf. For full marks show all your work: diagram, coordinate system, list the quantities & equations and the equation solving process.

Value :   /24

1. A tractor is pulling a 432.5 kg wagon of hay across the field with a horizontal force of 1648.0 N. If the coefficient of kinetic friction between the wheels of the wagon and the field is 0.27, determine (Value 10)
    a. the net force (if any) acting on the wagon
    b. its acceleration (if any).
    c. Since the wagon travels 50.0 m along this section of the field, how long does it take to travel along this section?

2. Santa leaves a roof top and travels 18.2 m along its edge in 2.08 s until he and the reindeer are airborne. (Value 8)
    a. What is the acceleration of Santa's sleigh?
    b. The reindeer are pulling with a horizontal force of 6373.5 N, the sleigh and all of its contents weigh 6656.09N. If the coefficient of kinetic friction between the sleigh and the icy roof is 0.10, what is the collective mass of Santa, his sleigh and all the toys?

3. A freight elevator at a warehouse starting from rest is able to lift materials within 6.52 s between floors that are separated by 6.8 m. If the maximum allowable tension on the elevator's cable is stated to be 2410.0 N, and the weight of the elevator is 2332.82N, what is the greatest mass of materials that can be lifted floor to floor? (Value 6)