

In class work 6 has questions 1 through 2 with a total of 9 points. Turn in your work at the end of class *on paper*. This assignment is due *Wednesday 27 September 13:15 PM*.

1. As a function of time  $t$  (seconds), the position  $s$  (feet) of a 1952 Farmall 44 horse-power tractor moving along a flat piece of Floyd's Creek Road is given by  $s = 2t^{3/2}$ . This relation holds for  $1 \leq t \leq 9$ .

1 (a) Find the *displacement* of the tractor on the time interval  $[1, 9]$ . That is, find  $s|_{t=9} - s|_{t=1}$ .

1 (b) Find the *average velocity* of the tractor on the time interval  $[1, 9]$ . That is, find  $\frac{s|_{t=9} - s|_{t=1}}{9-1}$ .

1 (c) Find the *velocity* of the tractor at the time  $t = 1$ . That is, find  $\left. \frac{ds}{dt} \right|_{t=1}$ .

1 (d) Find the *velocity* of the tractor at the time  $t = 9$ . That is, find  $\left. \frac{ds}{dt} \right|_{t=9}$ .

1 (e) Find the *acceleration* of the tractor at the time  $t = 2$ . That is, find  $\left. \frac{ds}{dt} \right|_{t=9}$ .

1 (f) Show that  $av$ , where  $v$  is the velocity and  $a$  is the acceleration of the tractor is a constant for times  $t$  in the interval  $[1, 9]$ .

2. The position  $s$  of my pet American Fuzzy Lop rabbit Wilber moving along a line as a function of  $t$  is  $s = \frac{1}{2}t^2 - 2t + 4$ , where we consider positive values of  $s$  to be to the

right and negative to the left.

1 (a) When is Wilber moving to the right? That is, when is  $\frac{ds}{dt} > 0$ ?

1 (b) When is Wilber moving to the left? That is, when is  $\frac{ds}{dt} < 0$ ?

1 (c) Find Wilber's *speed* when  $t = 2$ .