MATH 115 **Name:** _____

In class work 6, Fall 2022 **Row and Seat:** _____

In class work 6 has questions 1 through 2 with a total of 10 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 44 horsepower 1952 Farmall ® tractor moving along a flat piece of Wilber 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 $\left.\frac{\mathrm{d}s}{\mathrm{d}t}\right|_{t=1}$.

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

1 (e) Find the *acceleration* of the tractor at the time $t = 2$. That is, find $\left.\dfrac{\mathrm{d}^2 s}{\mathrm{d}t^2}\right|_{t=9}$.

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 $\dfrac{\mathrm{d}s}{\mathrm{d}t} > 0$?

1 (b) When is Wilber moving to the left? That is, when is $\dfrac{\mathrm{d}s}{\mathrm{d}t} < 0$?

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

1 (d) When is Wilber's *speed* zero?