(6.5) Average Value of a Function

Full Name: _____

1. Find the average value of the function on the given interval.

   (a) Recall that computing the average value of a function involves the formula $\frac{1}{b-a}\int_a^b f(x)\,dx$. In effect, this involves finding the height of a rectangle that, on the interval $[a,b]$, would define an area equal to the area between the graph of $f(x)$ and the x-axis. This part is a direct application of the formula.

   (b) Similar to (a).

   (c) Similar to (a), with the additional observation that in order to find $F(x)$, we will need to use u-substitution.

   (d) Similar to (c).

2. Note that $t = 0$ occurs at $9:00$. This will be important in order to determine the bounds correctly. Otherwise, we are simply using the average value formula.

3. Similar to 2. Note that this exercise also asks for when the volume is equal to this amount. This will involve setting the function for volume, namely $V(t)$, equal to the average value. Such a value (or values) will certainly exist since V is a continuous function, so the graph of the function cannot "jump" its average value.