1. [7 points] The table below gives values of a function, $f(x)$, at several points.

x	4	5	6	7	8
$f(x)$	3	5	4	1	2

a. [3 points] Estimate the integral $\int_4^8 f(x)dx$ using Mid(2). Be sure to write out all the terms of your sum.

b. [4 points] Simplify the integral
$$\int_{\ln(4)}^{\ln(7)} e^x f(e^x)dx$$
and estimate the resulting integral using Trap(3). Be sure to show how you simplified the integral and to write out all the terms of your sum.

2. [5 points] Suppose that $g(x) = w(x)v(x)$ where the functions $w(x)$ and $v(x)$ are both positive, decreasing and concave down on the interval $[0, 1]$.

a. [2 points] Write the derivatives $g'(x)$ and $g''(x)$ in terms of $w(x)$, $v(x)$, and their derivatives.

$$g'(x) = \underline{\hspace{5in}}$$

$$g''(x) = \underline{\hspace{5in}}$$

b. [3 points]   Circle the method(s) that will ALWAYS UNDERESTIMATE the integral $\int_0^1 g(x)dx$.

       Left   Right   Mid   Trap