1. [13 points] Given below is a table of values for the **decreasing** function $H(w)$ and its derivative, $H'(w)$. Suppose the functions $H(w)$, $H'(w)$, and $H''(w)$ are all defined and continuous on $(-\infty, \infty)$.

w	0	1	2	3	4	5	6	7	8	9	10
$H(w)$	15	13	12	10	9	7	6	5	3	1	0
$H'(w)$	0	-1	-5	-3	-3	-2	-1	0	-1	0	-2

a. [3 points] Use a right–hand Riemann sum with **five** equal subdivisions to estimate $\int_0^{10} H(w)\,dw$. Write out all the terms in your sum. You do not need to simplify, but your answer should not include the letter H.

b. [1 point] Does the answer to part **a.** overestimate, underestimate, or equal the value of $\int_0^{10} H(w)\,dw$? Circle your answer. If there is not enough information, circle NEI. You do not need to show any work for this part of the problem.

Answer: OVERESTIMATE UNDERESTIMATE EQUAL NEI

c. [2 points] How many equal subdivisions of $[0, 10]$ are needed so that the difference between the left and right Riemann sum approximations of $\int_0^{10} H(w)\,dw$ is exactly 1.5?

Answer: _____

1. (continued) *The information from the problem is repeated for convenience.*

Given below is a table of values for the **decreasing** function $H(w)$ and its derivative, $H'(w)$. Suppose the functions $H(w)$, $H'(w)$, and $H''(w)$ are all defined and continuous on $(-\infty, \infty)$.

w	0	1	2	3	4	5	6	7	8	9	10
$H(w)$	15	13	12	10	9	7	6	5	3	1	0
$H'(w)$	0	-1	-5	-3	-3	-2	-1	0	-1	0	-2

In **d.**–**f.**, give numerical answers.

d. [2 points] Find the average rate of change of $H'(w)$ on the interval $[3, 7]$.

Answer: _____

e. [2 points] Use the table to estimate $H''(1.5)$.

Answer: _____

f. [3 points] Find $\displaystyle\int_2^5 \left(3H'(w) - 2w\right)\ dw$.

Answer: _____