1. [13 points] Given below is a table of values for a function $h(x)$ and its derivative $h'(x)$. The functions $h(x)$, $h'(x)$, $h''(x)$, and $h'''(x)$ are all defined and continuous on $(-\infty, \infty)$.

x	-6	-4	-2	0	2	4	6
$h(x)$	2	-0.5	-2	-3	1	4	3
$h'(x)$	0	-4	-1	0	3	0	-2

Assume that between consecutive values of x given in the table above, $h(x)$ is either **always increasing** or **always decreasing**.

In **a.**–**c.**, find the numerical value **exactly**, or write NEI if there is not enough information provided to do so. *You do not need to show work on this page, but limited partial credit may be awarded for work shown.*

a. [2 points] Find the average rate of change of $h(x)$ from $x = -6$ to $x = -2$.

Answer: _____

b. [2 points] If the average value of $h'''(x)$ on the interval $[-6, 0]$ is 2, find

$$5 \cdot \int_{-6}^{0} \big(1 + h'''(x)\big)\ dx.$$

Answer: _____

c. [3 points] Find $\displaystyle\int_{-4}^{-2} \big(2h'(x) + x\big)\ dx$.

Answer: _____

d. [2 points] Find an equation for the tangent line to the graph of $h(x)$ at $x = 6$.

Answer: _____

This problem continues on the next page.

This problem continues from the previous page. The problem statement is repeated for convenience.

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x	-6	-4	-2	0	2	4	6
$h(x)$	2	-0.5	-2	-3	1	4	3
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Assume that between consecutive values of x given in the table above, $h(x)$ is either **always increasing** or **always decreasing**.

e. [2 points] Use a left Riemann sum with three equal subdivisions to estimate $\displaystyle\int_{-6}^{6} h(x)\,dx$. Write out all the terms in your sum, which you do not need to simplify.

f. [2 points] Fill in each blank below with one of the following:

$$\boxed{\leq}, \quad \boxed{\geq}, \quad \boxed{=} \text{ or } \boxed{\text{NEI}}$$

where NEI means there is not enough information to decide. You need not justify your answers.

i. $\displaystyle\int_{-6}^{0} h(x)\,dx$ _____ $2h(-6) + 2h(-4) + 2h(-2)$.

ii. $\displaystyle\int_{0}^{6} h(x)\,dx$ _____ $2h(0) + 2h(2) + 2h(4)$.