4. [15 points] For this problem, m is a differentiable function with $m'(x) > 0$ for all x. The following table gives some values of m.

x	0	1	2	3	4	5	6	7	8
$m(x)$	0	2	3	4	6	9	10	11	12

a. [3 points] What is the average value of $m'(x)$ on $[1, 7]$?

b. [3 points] Use a left Riemann sum with 3 subdivisions to estimate $\int_2^8 m(x)\, dx$. Write out each term of your sum. Is this an overestimate or underestimate?

c. [3 points] Use a midpoint sum with 3 subdivisions to estimate $\int_0^{12} m^{-1}(y)\, dy$. Write out each term of your sum.

d. [6 points] Consider the region bounded by the y-axis, the line $y = 12$ and the curve $y = m(x)$. Write an integral that gives the volume of the solid obtained by rotating this region about the y-axis. Use a right Riemann sum with 2 subdivisions to estimate your integral. Write out each term of your sum.