7. [11 points] Some values of a function $m(x)$ and its derivatives are given below.

x	0	2
$m(x)$	4	1
$m'(x)$	-1	0
$m''(x)$	0	0
$m'''(x)$	3	-2
$m''''(x)$	5	8

a. [4 points] Find a formula for $P_4(x)$, the Taylor polynomial of degree 4 for $m(x)$ about $x = 2$.

Answer: $P_4(x) =$ _____

b. [3 points] Use your answer to approximate the value of $\int_1^3 m(x)\,dx$. Show your work.

Answer: $\int_1^3 m(x)\,dx \approx$ _____

c. [4 points] Let $G(x)$ be the antiderivative of the function $g(x) = m(3x^2)$ with $G(0) = 5$. Find the first three nonzero terms of the Taylor series for $G(x)$ about $x = 0$.

Answer: _____