7. [10 points] Consider the function

$$g(x) = \frac{1}{3}\cos(x^2) - x\sin(x).$$

a. [5 points] Give the first three non-zero terms of the Taylor series of $g(x)$ centered about $x = 0$. Show all your work.

Answer: _____

b. [5 points] The function $g(x)$ has a continuous antiderivative, $G(x)$, with a Taylor series that converges for all x. Given that $G(0) = 8$, find the first four non-zero terms of the Taylor series for $G(x)$ centered about $x = 0$. Show all your work.

Answer: _____