Quiz 5

Answer the questions in the spaces provided. If you run out of room for an answer, continue on the back of the page.

Question:	1	2	Total
Points:	25	0	25
Score:			

Name and section: _____

1. The general form of the Taylor series of a function $f(x)$ around the point a is

$$f(x) = \sum_{i=0}^{\infty} \frac{1}{i!} \left. \frac{\mathrm{d}^i f(x)}{\mathrm{d}x^i} \right|_{x=a} (x-a)^i \tag{1}$$

where the value of the ith derivative is evaluated at the point $x = a$.

(a) (10 points) What is the Taylor series of $f(x) = \sin(x)$ up to $i = 3$ (third order) using the above expression around the point $x = 0$?

$f(x) \approx$

(b) (10 points) What is the Taylor series of $g(x) = ax^3 - bx$ around $x = 0$ up to third order ($i = 3$)?

$g(x) \approx$

(c) (5 points) How does the Taylor series of $g(x)$ change if we take the Taylor series to fourth order ($i = 4$)? Answer in no more than one sentence.

2. For fun if you finish early: Up to second order, what is the Taylor series of the function

$$h(x, y) = \sin(x)\cos(y) \tag{2}$$

around the point $(x, y) = (\pi, 0)$?