quiz 1
math1117-07
u new haven
4 september 2019

name: Solution

1 (10 points). Let $f(x) = x^2 - 4$ and $g(x) = x^3$. Evaluate the expression $g(f(u))$.

2 (10 points). Determine whether the graph of the following function is symmetric about the x-axis, y-axis or the origin: $f(x) = x^4 + 5x^2 - 12$. (For two extra credit points, describe why $f(x)$ is not symmetric about the x-axis in one or two sentences and no calculations.)

① $g(f(u)) = g(u^2-4) = (u^2-4)^3$

② • EC. The only function that's symmetric about the x-axis is the zero function, but $f(x)$ isn't that.

• y-axis symmetry means: $(x, f(x))$ on the graph then $(-x, f(x))$ is also on the graph

Since $(-x, f(x))$ is on the graph ~~we~~ if $f(-x) = f(x)$ then $(-x, f(x))$ is on the graph.

$$f(-x) = (-x)^4 + 5(-x)^2 - 12 = x^4 + 5x^2 - 12 = f(x).$$

So $f(x)$ is y-axis symmetry.

• origin symmetry means $(x, f(x))$ on the graph then $(-x, -f(x))$ is also on the graph.

Since $(-x, f(-x))$ is on the graph, if $f(-x) = -f(x)$ then $(-x, -f(x))$ is too.

$$-f(x) = -(x^4 + 5x^2 - 12) = -x^4 - 5x^2 + 12 \neq f(-x)$$

so $f(x)$ is not origin symmetric