Name: _____ Academic Integrity Signature: _____

I have abided by the UNCG Academic Integrity Policy.

Note: Correct numerical answers without justification will receive little or no credit.

1. (2 points) Compute $\lim_{t\to 0} \dfrac{\sin(7t)}{t}$.

Solution: Recall that we proved in class that $\lim_{\theta\to 0} \dfrac{\sin(\theta)}{\theta} = 1$. To compute given limit, multiply the numerator and denominator by 7. Then let $\theta = 7t$. Then as $x \to 0$, we have $\theta \to 0$.

$$\begin{aligned}
\lim_{t\to 0} \frac{\sin(7t)}{t} &= \lim_{t\to 0} \frac{7\sin(7t)}{7t} \\
&= 7\lim_{t\to 0} \frac{\sin(7t)}{7t} \\
&= 7\lim_{\theta\to 0} \frac{\sin(\theta)}{\theta} && \text{Let } \theta = 7t. \\
&= 7 \cdot 1 \\
&= 7.
\end{aligned}$$

2. (3 points) (Definition) A function f is *continuous* at an interior point c of its domain if

Solution:

$$\lim_{x\to c} f(x) = f(c).$$

3. (5 points) Complete the statement of the *Intermediate Value Theorem.*

Let f be a [ ] function on the interval $[a, b]$. Let y_0 be any value between [ ] and [ ]. Then there exists a c between [ ] and [ ] such that [ ]

Solution: Let f be a [continuous] function on the interval $[a, b]$. Let y_0 be any value between [$f(a)$] and [$f(b)$]. Then there exists a c between [a] and [b] such that [$f(c) = y_0$].

 Points earned: _____ out of 10.