MAC 2312 (Calculus II) — Answers
QUIZ 1, Friday August 26, 2016

Name: **PID:**

Remember to show all your work; you won't get any credits if only your answers are shown without the steps leading to them.

1. [4] a) Use the sigma notation to write, but do not evaluate:
$-1+\frac{1}{3}-\frac{1}{9}+\frac{1}{27}-\frac{1}{81}=$ $\sum_{k=1}^{5}\frac{(-1)^k}{3^{k-1}}$ 0.5 for each
$=\sum_{k=0}^{4}\frac{(-1)^{k+1}}{3^k}$

b) Evaluate: $\sum_{k=1}^{4}\cos^2(\frac{k\pi}{4})=$ $\cos^2\frac{\pi}{4}+\cos^2\frac{\pi}{2}+\cos^2\frac{3\pi}{4}+\cos^2\pi$ 1
$=\frac{1}{2}+0+\frac{1}{2}+1$ 0.25 for each
$=2$

2. [4] a) Write the definite integral $\int_1^3 \sec^2(e^x)\,dx$ as the limit of a Riemann sum

$\int_1^3 \sec^2(e^x)\,dx = \lim_{\max\Delta x_k\to 0}\sum_{k=1}^{n}\sec^2(e^{x_k^*})\Delta x_k$
$= \lim_{\max\Delta x_k\to 0}\sum_{k=1}^{n}\sec^2(e^{x_k^*})\Delta x_k$ 1

b) Given that $a=0$ and $b=1$, use those values to express the following limit as an integral, but do not evaluate the integral:

$\lim_{\max\Delta x_k\to 0}\sum_{k=1}^{n}\frac{7^{x_k^{*2}}}{1+x_k^*}\Delta x_k = \int_0^1 \frac{7^{x^2}}{1+x}\,dx$ 2
← no credit if x_k^* is used in the integral

3. [2] Decide whether each statement is true or false. No explanation needed.

1 a) If $f(x)=\begin{cases}3x-1, & \text{if } 2\le x\le 3,\\ x^2+1, & \text{if } 3<x\le 4,\end{cases}$ then f is integrable on the interval $[2,4]$. True, $5\le f(x)\le 17$ for all x in $[2,4]$ and f is discontinuous at $x=3$ only

1 b) If a function f is continuous on $[-5,6]$, then f is integrable on $[-5,6]$. True, by Theorem 5.5.2 in text or Remark discussed in notes