Math 182 Honors Quiz 9 Version A

This quiz is to be taken in the computer lab. You may use your textbook and classroom notes as well as Maple and other software. For this quiz the Maple commands

```
int(1/(x^3-1),x); int(tan(2*x)^2,x);
int(sqrt(x+2),x=1..2); int((1+x+x^2)*exp(x),x=0..2);
```

could be particularly helpful. You may also use internet resources such as Wolfram Alpha, but do not use email or any kind of interactive messaging.

1. Solve the following integration problems.

(i) $\displaystyle\int \frac{1}{x^3 - 1}\, dx$

(ii) $\displaystyle\int \tan^2(2x)\, dx$

(iii) $\displaystyle\int_1^2 \sqrt{x + 2}\, dx$

(iv) $\displaystyle\int_0^2 (1 + x + x^2)e^x\, dx$

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2. Determine whether the following infinite series converge and explain your answer. You may use the integral test, ratio test, root test, comparison test or limit comparison test in your explanation.

(i) $\displaystyle\sum_{n=1}^{\infty} n^2$

(ii) $\displaystyle\sum_{n=1}^{\infty} \frac{1}{n^{1.02}}$

(iii) $\displaystyle\sum_{n=1}^{\infty} \frac{n^2}{n!}$

(iv) $\displaystyle\sum_{n=27}^{\infty} \frac{\log n}{n}$