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

Student's Name: _____

Instructor's name: _____

Do the following series converge or diverge?

1.

$$\sum_{n=3}^{\infty} \frac{\mathbf{e}^{4n}}{(n-2)!}$$

$$L = \lim_{n\to\infty} \left| \frac{a_{n+1}}{a_n} \right| = \lim_{n\to\infty} \left| a_{n+1} \frac{1}{a_n} \right| = \lim_{n\to\infty} \left| \frac{\mathrm{e}^{4(n+1)}}{(n+1-2)!} \frac{(n-2)!}{\mathrm{e}^{4n}} \right|$$

$$= \lim_{n\to\infty} \left| \frac{\mathbf{e}^{4n+4}}{(n-1)!} \frac{(n-2)!}{\mathbf{e}^{4n}} \right| = \lim_{n\to\infty} \left| \frac{\mathbf{e}^{4n+4}}{(n-1)(n-2)!} \frac{(n-2)!}{\mathbf{e}^{4n}} \right| = \lim_{n\to\infty} \left| \frac{\mathbf{e}^{4}}{n-1} \right| = 0$$

We can see that $L = 0 < 1$ thus by the Ratio Test the series converges.