1. (1) (2 points) Which x can make the power series $\sum_{n=0}^{\infty} \frac{(x-2)^n}{3^{n-1}}$ converge? select all that applies.

$$\text{A. } x = -1 \quad \text{B. } x = 1 \quad \text{C. } x = 2 \quad \text{D. } x = 5 \quad \text{E. } x = 7$$

(2) (2 points) For any number x which can make the series converge, find $\sum_{n=0}^{\infty} \frac{(x-2)^n}{3^{n-1}}$. (Express the sum in terms of x.)

2. (3 points) Determine whether the following series

$$\sum_{n=1}^{\infty} (-1)^n \frac{4n^2 + 1}{5^n}$$

is absolutely convergent, conditionally convergent, or divergent.

3. (3 points) Determine whether the following series

$$\sum_{k=2}^{\infty} (-1)^k \frac{\ln(k)}{\sqrt{k}}$$

is absolutely convergent, conditionally convergent, or divergent.

Please fold the paper and write your NAME and UT EID clearly on the back.