

2. [18 points] For each of the following series, write whether the series “Converges” or “Diverges” on the space provided next to the series. Support your answer by stating the test(s) you used to prove convergence or divergence, and show complete work and justification.

a. [6 points]  $\sum_{n=2}^{\infty} \frac{\sqrt{n^2+1}}{n^2-1}$  \_\_\_\_\_

b. [6 points]  $\sum_{n=1}^{\infty} \frac{n!(n+1)!}{(2n)!}$  \_\_\_\_\_

c. [6 points]  $\sum_{n=2}^{\infty} \frac{\sin(n)}{n^2-3}$  \_\_\_\_\_