Name: _____

TA's Name: _____

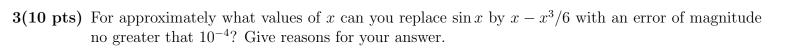
Instructions: You must show supporting work to receive full and partial credits. No text book, notes, formula sheets allowed.

1(15 pts) Find the sum of the following:

(a)
$$\sum_{n=3}^{\infty} (-1)^{n-1} \frac{3}{5^n}$$

(b)
$$\sum_{n=1}^{\infty} \frac{1}{n(n+1)}$$

2(10 pts) Find the Taylor polynomial $P_2(x)$ and the remainder $R_2(x)$ for the function $f(x) = \sqrt{1+x}$ at x = 3.



4(10 pts) Estimate the number of terms needed in order for the *n*th partial sum S_n to approximate this series $\sum_{n=1}^{\infty} (-1)^n \frac{1}{n2^{n+1}}$ to the 8th decimal place accuracy.

5(30 pts) Determine if the following series converge absolutely, or conditionally, or diverge.

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

(b)
$$\sum_{n=2}^{\infty} (-1)^n \frac{1}{n \ln n}$$

(c)
$$\sum_{n=0}^{\infty} \frac{2^n (n!)^2}{(2n)!}$$

