

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

$$|S - S_N| \leq b_{n+1}$$

$$\frac{1}{5n^2+1} \leq 0.001$$

$$5n^2+1 \geq 1000$$

$$5n^2 \geq 999$$

$$n^2 \geq$$

34. $\sum_{n=1}^{\infty} (-4)^{-n}$

$$= \frac{1}{-4^n}$$

$$\lim_{n \rightarrow \infty} \left| \frac{a_{n+1}}{a_n} \right| = \left| \frac{4^n}{4 \cdot 4^n} \right| = \frac{1}{4} < 1$$

! converges absolutely

33. $\sum_{n=1}^{\infty} (-1)^n \frac{1}{6n^{1/3}+1}$

$$\lim_{n \rightarrow \infty} \left| \frac{a_{n+1}}{a_n} \right| = \left| \frac{6n^{1/3}+1}{6(n+1)^{1/3}+1} \right|$$

$$\frac{-1/9}{1 + 1/9}$$

$$= \frac{-1/9}{10/9} = -\frac{1}{10}$$

Ratio

$$\lim_{n \rightarrow \infty} \left| \frac{a_{n+1}}{a_n} \right| = \left| \frac{(n+1)!}{500^{n+1}} \times \frac{500^n}{n!} \right|$$

$$= \frac{7}{10}$$

$$= \lim_{n \rightarrow \infty} \left(\frac{n+1}{500} \right)$$