Math 132 Quiz
9 AM - 10 AM

NAME:________________

1. Is the series
$$\sum_{n=2}^{\infty}(-1)^n\frac{3^{2n}}{10^n\cdot\sqrt{n^3+1}}$$
absolutely convergent, is it conditionally convergent, or is it divergent?

$$\lim_{n\to\infty}\left|\frac{a_{n+1}}{a_n}\right| = \lim_{n\to\infty}\frac{3^{2(n+1)}}{10^{n+1}\sqrt{(n+1)^3+1}}\cdot\frac{10^n\sqrt{n^3+1}}{3^{2n}}$$

$$= \frac{3^2}{10}\lim_{n\to\infty}\sqrt{\frac{n^3+1}{(n+1)^3+1}} = \frac{9}{10} < 1$$

Absolutely convergent by ratio test

2. What is the interval of convergence of
$$\sum_{n=2}^{\infty}\frac{2^n(-1)^n(x+5)^n}{3\ln(n)} = \sum_{n=2}^{\infty}\frac{2^n(-5-x)^n}{\ln(n^3)}?$$

$c=-5$

$$\frac{1}{R} = \lim_{n\to\infty}\left|\frac{a_{n+1}}{a_n}\right| = \lim_{n\to\infty}\frac{2^{n+1}}{3\ln(n+1)}\cdot\frac{3\ln(n)}{2^n} = 2\lim_{n\to\infty}\frac{\ln(n)}{\ln(n+1)} = 2 \implies R=\frac{1}{2}$$

Left endpoint: $x=-5-\frac{1}{2}$ $\quad \sum_{n=2}^{\infty}\frac{2^n(-1)^n(-\frac{1}{2})^n}{3\ln(n)} = \sum_{n=2}^{\infty}\frac{1}{3\ln(n)}$ DIV

Right endpoint: $x=-5+\frac{1}{2}$ $\quad \sum_{n=2}^{\infty}\frac{2^n(-1)^n(\frac{1}{2})^n}{3\ln(n)} = \sum_{n=2}^{\infty}\frac{(-1)^n}{3\ln(n)}$ CONV

$$\left(-5-\frac{1}{2},\ -5+\frac{1}{2}\right] = \left(-\frac{11}{2},\ -\frac{9}{2}\right]$$