

Math 231 Exam #2 Spring 2007

1. (20 pts) Determine the limit of each **sequence** if it converges, or explain why it diverges.

(a) $\lim_{n \rightarrow \infty} \frac{6n + 5}{11n - 1}$

(b) $\lim_{n \rightarrow \infty} \frac{(\ln n)^2}{n^{1/10}}$

2. (20 points) Find the sum of each series. Hint: first find a formula for the partial sums.

(a) $\sum_{n=1}^{\infty} \frac{5}{2^{n+3}}$

(b) $\sum_{n=1}^{\infty} \left(\frac{1}{\sqrt{n}} - \frac{1}{\sqrt{n+1}} \right)$.

3. (24 pts) For each series, determine whether it converges or diverges. Say what tests you use.

(a) $\sum_{n=1}^{\infty} \frac{n}{n^3 + 2}$

(b) $\sum_{n=1}^{\infty} \frac{2007^n}{\sqrt{n!}}$

4. (24 pts) For each series, classify it as either conditionally convergent, absolutely convergent, or divergent.

(a) $\sum_{n=1}^{\infty} \frac{(-1)^n}{n + 2007}$

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

5. (12 pts) Classify the series as either conditionally convergent, absolutely convergent, or divergent.

$$\sum_{n=1}^{\infty} n \left(-\frac{1}{2} \right)^n$$