

My Office Hours: M & W 2:30–4:00, Tu 2:00–3:30, & F 1:30–2:30 or by appointment. **Math**

Intern: Sun: 2:00–5:00, 7:00–10pm; Mon thru Thu: 3:00–5:30 and 7:00–10:30pm in Lansing 310.

Website: <http://math.hws.edu/~mitchell/Math131F15/index.html>.

☛ Practice

Read 8.3 and begin 8.4 about Series including the Integral Test in 8.4. **Read the online notes, too, for more examples.** This is great stuff! But it requires lots of practice.

1. Try page 622ff # 19–27(odd), 35, 37, 55, 57, and 61.
2. Try page 638 #43 and 45. Split into two pieces

Hand In

Finish WeBWork Day 31A and begin WeBWork Day 32 on series.

1. Let's start with three easy geometric series. Determine whether each converges and if so, to what.

$$(a) \sum_{n=0}^{\infty} \left(\frac{2}{3}\right)^n \quad (b) \sum_{n=0}^{\infty} 4 \left(\frac{-2}{5}\right)^n \quad (c) \sum_{n=0}^{\infty} 6 \left(\frac{5}{4}\right)^n$$

2. Each of these has a twist that requires some adjustment. Slow down.

(a) Page 623 #30. (Be careful!)

(b) Evaluate $\sum_{n=0}^{\infty} 3 \left(\frac{2}{5}\right)^{2n}$. (Write out the first few terms to identify a and r .)

(c) Evaluate $\sum_{k=1}^{\infty} 4 \left(\frac{1}{3}\right)^k$. (Write out the first few terms to identify a and r .)

(d) Evaluate $\sum_{k=2}^{\infty} 3 \left(-\frac{1}{2}\right)^k$. (Write out the first few terms to identify a and r .)

3. Find the sum of the series $8 + 6 + \frac{9}{2} + \frac{27}{8} + \frac{81}{32} + \dots$. Hint: Is this a geometric series? What are a and r ?

4. If we get this far. Here's a telescoping series: $\sum_{k=0}^{\infty} \left(\frac{2}{k+2} - \frac{2}{k+3}\right)$.

(a) Write out several terms of the n th partial sum S_n and then simplify it by telescoping.

(b) Evaluate $\lim_{n \rightarrow \infty} S_n$ and determine $\sum_{k=0}^{\infty} \left(\frac{2}{k+2} - \frac{2}{k+3}\right)$.

5. Apply telescoping to $\sum_{k=0}^{\infty} \ln \left(\frac{k+2}{k+1}\right)$ by using a log property.

6. Optional Bonus (or continue to next problem): Apply telescoping to p 624 #68.

7. Optional Bonus: **Carefully read** about the Divergence Test on Page 627. Then read Example 1 on Page 628. Now do Page 638 #10, 12, and 14.