## Part I: (due at the beginning of class Monday, March 25)

Complete Example 1 on the blue Integral Test handout for Part I for Monday.

Remember that what you turn in for Part I should have 3 parts, as mentioned in the syllabus:

(a) Your responses to the reading questions.

(b) Your own questions/comments on the reading/anything else we've been doing in class.

(c) The amount of time you spent on Part I (including the time spent reading/watching).

## Part II: Exercises (prepare for class Monday, March 25)

1. Does the given series converge or diverge? If converges, find the sum:

   (a) $5 - \frac{10}{3} + \frac{20}{9} - \frac{40}{27}$

   (b) $\sum_{n=1}^{\infty} 2^{2n} 3^{1-n}$

## Part III: Homework Problems (due Wednesday, March 27 at the beginning of class)

Review the guidelines and Sample Homework in the syllabus to make sure your Part III solutions follow them.

1. Find the sum of the series $\sum_{n=1}^{\infty} \frac{3}{n^2+3n+2}$, if it converges.

2. The process we used in class to find the sum of a general geometric series is very similar to the process we use to convert repeating decimals to fractions: we multiply the repeating decimal by some value $r$ (based on the period of the repeat), subtract appropriately, and divide to solve for the original decimal.

   For example, consider $0.353535\ldots$. Call this number $A$. The repeating portion 35 has two digits, so we multiply $A$ by 100 to move the decimal over two places, which gives $100A = 35.353535\ldots$. Now all the decimal places in $A$ and $100A$ line up, so we can subtract $A$ from $100A$ to get $99A$ on the left side and 35 on the right side:

$$\begin{array}{rrcl} & 100A & = & 35.353535\ldots \\ - & A & = & 0.353535\ldots \\ \hline & 99A & = & 35.000000\ldots \end{array}$$

We have $99A = 35$, so when we divide by 99, we get $A = \frac{35}{99}$.

Show a similar process to convert each of the repeating decimals (which can be thought of as infinite series) into fractions:

(a) $0.201920192019\ldots$

(b) $0.124786351247863512478635\ldots$

3. Suppose we wanted to geometrically find the sum of $\displaystyle\sum_{n=1}^{\infty} \frac{1}{7^n}$. Describe a process to use a regular polygon—explain which one we would need—(similar to what we did with the octagon in class) to find the sum of this series. Explain how we would create a picture that shows the terms of the series in the polygon and how we would use the picture to find the sum of the series from the polygon.