MATH 5B - Single Variable Calculus II — Spring 2019

§11.2 Sequences

In-class Activity 11.2

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Activity 1:

Let $\{a_i\}_{i=0}^{\infty}$ be a sequence whose partial sums are $S_n = \frac{4n^2-3n-7}{1-6n-8n^2}$. What is $\sum_{i=0}^{\infty} a_i$?

Activity 2:

Does $\sum_{n=1}^{\infty} \frac{1}{n(n+1)}$ converge or diverge? If it converges, find its sum.

(Hint: use partial fractions to express $a_n = \frac{1}{n(n+1)}$ as a difference and look for a clever trick for S_n.)

Activity 3:

(a) Write $\frac{13}{51}$ in decimal notation. (Long Division)

(b) Write $7.1\overline{24}$ as a fraction. (Tens Trick)

Activity 4:

Converge or Diverge?

(a) $\sum_{n=0}^{\infty} 5^{-n}$

(b) $\sum_{i=0}^{\infty} 2^{2i}3^{1-i}$

(c) $\sum_{k=0}^{\infty} -7\left(-\frac{3}{4}\right)^{k}$

Activity 5:

If $x \in (-1, 1)$, does

$$\sum_{n=0}^{\infty} x^n$$

converge or diverge? If it converges, what does it sum to?

Activity 6:

(a) Evaluate the series: $\sum_{n=0}^{\infty} \left(\frac{2 + 3^n}{5^n} - 3\frac{1}{2^n} \right)$

(b) Show that $\sum_{j=0}^{\infty} \frac{3j^2}{j^2 + j + 1}$ diverges.