

Add it up!

We've been studying **sequences**, which are simply lists of numbers. Today we will begin looking at **series**, which are sums of sequences.

1. You rent out a storage space, and there's a deal that the cost of the rental goes down by two percent each month. The first month's rent is \$24.

(a) Show why the rent in the third month is \$23.05.

(b) Let R_n represent the rent in month n , and let's have $R_1 = 24$. Give an **explicit** formula for R_n .

(c) You are interested in how much you will have to pay over the first twelve months of your rental. Fill in the blank:

$$\text{TOTAL RENT} = \sum_{n=1}^{12} R_n = \sum_{n=1}^{12} \underline{\hspace{2cm}}$$

(d) Calculate this sum by adding up the 12 numbers.

(e) LATER: Use the Finite Geometric Sum Formula to check your answer to (d). Show your calculation.

2. Here's a fun problem that shows up in Math 271 Discrete Mathematics: What happens if we add up the first n odd numbers?

(a) Let S_n be the sum of the first n positive odd numbers. So $S_3 = 1 + 3 + 5$. Calculate S_3 , S_4 , and S_5 .

(b) Write a formula for S_n using sigma (Σ) notation.

(c) What do you notice about S_n ? Give a formula for S_n that is not a sum.

(d) Explain how this image is relevant to this result.

