Sequences (All Together–Arithmetic and Geometric)

Here are questions that combine the Arithmetic and Geometric Sequences (some ask $a_n$ questions, others ask $S_n$ questions). Make sure you pick which kind of sequence we’re working with and what kind of question you’re being asked.

1. Taylor owns a small business, in March 2015 his monthly profit was $3000. In April 2015 his monthly profits increased by 2%. Assuming that his monthly profits continue to increase by 2% each month:

   GEO

2. Sam owns a small business, in March 2015 her monthly profit was $3000. In April 2015 her monthly profits increased by $60. Assuming that her monthly profits continue to increase by $60 a month:

   ARITH

3. You have a shop on Etsy, selling hand painted Holiday cards with crass/vulgar/mean sayings on them. In March, you sold $30 worth of these mean holiday cards. In April, you sold $33 worth of these cards, and in May you sold $36.30 worth of these cards. Assuming this trend continues, how much total will you make selling these B*tchy Holiday cards between March and December?

   GEO, answer with $S_n$

4. Your friend just took over running a business. Yesterday (day 1) they have a daily profit of $1000. Today (day 2) they have a daily profit of $9977.... Obviously they’re not amazing at running this particular business. Assuming their daily profit continues to fall by $23 a day, what is their daily profit on Day 731 (2 years, including a leap year)?

   ARITH, answer with $a_n$

5. Your other friend is a musician (kind of). They play music in the subway in NYC for donations. Last week (week 1) they made $12.40 in donations. This week (week 2) they make 5% more in donations (apparently they are a pretty good musician).
Assuming that each week they make 5% more than the previous week, how much do they make total during their first 30 weeks of subway-playing?

GEO, answer with $S_n$

6. A non-profit you volunteer for collects donations every week (you have to balance out your Karma after making those B*tchy holiday themed cards). This week (because of news coverage) they collected a record breaking $10,000. But (since the news cycle is so short), they anticipate they will only collect 85% of what they collected this week next week. Assuming the pattern continues and each week they collect 85% of what they collected the previous week, how much money will they collect on the last week of the year?

GEO, answer with $a_n$