Sequences (All Together)

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:
   
   (a) What is Taylor’s Monthly profits in April 2015?
   (b) What is Taylor’s Monthly Profits in May 2015?
   (c) What will Taylor’s monthly profits be in Feb. 2017?
   (d) How much will Taylor make from Mar ’15 - Feb ’17?

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:
   
   (a) What is Sam’s Monthly profits in April 2015?
   (b) What is Sam’s Monthly Profits in May 2015?
   (c) What will Sam’s monthly profits be in Feb. 2017?
   (d) How much will Sam make from Mar ’15 - Feb ’17?

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 worth of these cards. Assuming this trend continues, how much total will you make selling these B*tchy Holiday cards between March and December?

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 buy $23 a day, what is their daily profit on Day 731 (2 years, including a leap year)?
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?

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 amount, they collected $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?