Directions: Please answer the following questions and make sure your answer are legible. If you don’t show work and/or I can’t follow it, I won’t give partial credit. You may use a calculator (not the calculator function on other technology) and the Formula Sheet that I provide you, nothing else. Good Luck.

1. (5 points) This week (week 1) your new thrift store Uptown Trunk\(^1\) made a profit of $-1,000 (also known as a loss). You anticipate each week that your weekly profit will increase by $55. 
   
   (a) What is Uptown Trunk’s profit in week 2?
   
   (b) What is Uptown Trunk’s weekly profit at the end of the year (in week 52)?
   
   (c) How much money did Uptown Trunk make (or lose) total this year?

\[
\begin{array}{|c|c|}
\hline
\text{Week} & \text{Profit} \\
\hline
1 & -1000 \\
2 & -945 \\
3 & -890 \\
\hline
\end{array}
\]

\[a = -1000, \quad d = 55\]

\[a_1 = -1000\]

\[\begin{align*}
a_{52} &= -1000 + (52-1) \cdot 55 \\
&= 1405 \\
\text{Prof., } &1405 \\
\end{align*}\]

\[s_{52} = \text{total profit, year, total profit,} \\
\]

\[s_{52} = \frac{52}{2} \left(-1000 + 1405\right) \\
= 20,930 \text{ prof. for the year}\]

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\(^1\)You’re store’s motto is obviously “Stylin’, whilen, livin’ it up in the city. Got Chucks on with Saint Laurent. Got kiss myself, I’m so pretty.”
2. (5 points) Beyoncé was originally a member of Destiny’s Child, who released their first album in 1998 (18 years ago).

Assuming Beyoncé had no idea what sort of Superbowl-Halftime fame was in store for her, we’ll say she deposited $5,000 in 1998 into an account that paid 3.9% interest compounded annually, and then forgot about the money as she became a superstar and a mother. If she finds the account today (18 years later) how much in interest has she earned?

\[ FV = PV \left(1 + \frac{i}{n}\right)^n \]

\[ FV = 5000 \times \left(1 + \frac{0.039}{1} \right)^{18} \]

\[ \text{int} = 9955.20 - 5000 \]

\[ \text{int} = 4955.20 \]

\[ FV = 5000 \times \left(1 + 0.039\right)^{18} = 9955.20 \]

3. (5 points) Chris Martin (and Gwyneth Paltrow) had a daughter named Apple. Let’s assume they want to have an account that will have $10,000 in it for when she graduates college. They find that Yellow Bank will pay 2.87% interest compounded weekly. How much do they need to deposit if they hope the account will grow to $10,000 in 22 years?

\[ FV = PV \left(1 + \frac{i}{n}\right)^{nt} \]

\[ 10000 = PV \left(1 + \frac{0.0287/52}{1}\right)^{52 \times 22} \]

\[ 10000 = PV \left(1 + \frac{0.0287}{52}\right)^{1144} \]

\[ 10000 = PV \times 1.879913605 \]

\[ PV = 10000 / 1.879913605 \]

\[ PV = 5,319.29 \]

Deposit this much today.