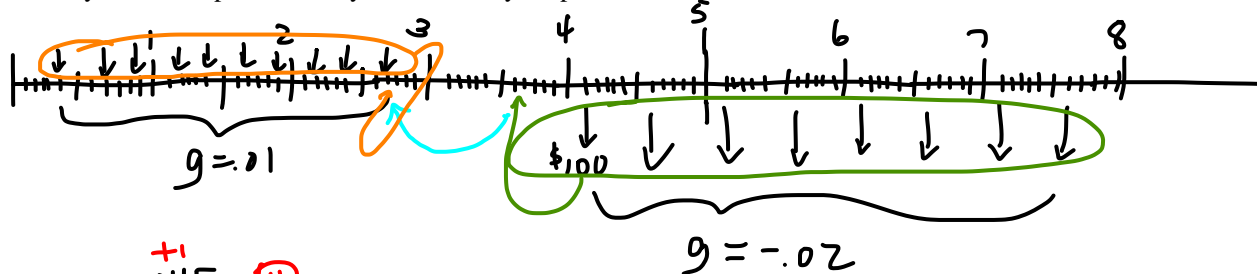Assume that five months from today you make the first of a series of quarterly deposits into an account earning an APR of 4.5% with monthly compounding. Each deposit is 1% larger than the last one and your final deposit occurs two years and eight months from today. Four years and one month from today, you make your first semiannual withdrawal from the account. The withdrawal *first* equals $100 and each subsequent withdrawal is 2% smaller than the previous one. Your final withdrawal will occur seven years and seven months from today. How large do you need to make your first deposit so that you can make your planned withdrawals?

$g = .01$

$g = -.02$

$+5 \left(r\left(\tfrac{1}{12}\right) = \dfrac{.045}{12} \right)$ ⑪

$\left(r\left(\tfrac{1}{4}\right) = \left(1 + r\left(\tfrac{1}{12}\right)\right)^3 - 1 \right)$ ⑩

$+5 \left(r\left(\tfrac{1}{2}\right) = \left(1 + r\left(\tfrac{1}{12}\right)\right)^6 - 1 \right)$ ⑤

$+5 \left(V_{3y7m} = \left(\dfrac{100}{r\left(\tfrac{1}{2}\right) - (-.02)}\right)\left(1 - \left(\dfrac{1-.02}{1+r\left(\tfrac{1}{2}\right)}\right)^8\right) \right)$ ⑮

$+5 \left(V_{2y8m} = V_{3y7m}\left(\dfrac{1}{1+r\left(\tfrac{1}{12}\right)}\right)^{11} \right)$ ⑩

set equal & solve for C +5 ⑤

$+5 \left(V_{2y8m} = \left(\dfrac{C}{r\left(\tfrac{1}{4}\right) - .01}\right)\left(\left(1 + r\left(\tfrac{1}{4}\right)\right)^{10} - \left(1 + .01\right)^{10}\right) \right)$ ⑲