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QUIZ 4

Show all work. Label and clearly explain your answer. *This is very important.* 1) You must explain how you arrived at your answer in order to get full credit. 2) If you do show your work, and your answer is wrong, you can still earn a substantial amount of credit depending on how serious the error is. 3) If your answer is wrong, and you don't show your work, you will get a zero.

Part 1. Suppose you borrow \$300,000 to purchase a house. The mortgage requires monthly payments for 30 years, and the loan rate is 4% annual rate, compounded monthly. Calculate your monthly payments for this loan.

Part 2. Suppose your bank offers you the option to make weekly payments instead of monthly payments. As before, the loan would be for 30 years, and the loan rate is unchanged at 4% annual rate, compounded monthly. Calculate your weekly payments for this loan.

$$\begin{aligned} 1. \quad k_m &= \frac{k_s}{12} = 0.3333\% \\ PV &= \frac{C}{k_m} \left(1 - \frac{1}{(1+k_m)^n} \right) \\ C &= \frac{PV \cdot k_m}{1 - \frac{1}{(1+k_m)^n}} = \frac{300,000 \cdot 0.3333\%}{1 - \frac{1}{(1+0.3333\%)^{30 \times 12}}} = 1432.18 \end{aligned}$$

$$\begin{aligned} 2. \quad (1+k_m)^{12} &= (1+k_w)^{52} \\ \Rightarrow k_w &= 0.07684\% \\ PV &= \frac{C}{k_w} \left(1 - \frac{1}{(1+k_w)^n} \right) \\ \Rightarrow C &= \frac{PV \cdot k_w}{1 - \frac{1}{(1+k_w)^n}} = \frac{300,000 \times 0.07684\%}{1 - \frac{1}{(1+0.07684\%)^{52 \times 30}}} = 330.13 \end{aligned}$$