Disco II - Quiz 12

Name:_____ Box #_____

1. Recursion

Your borrow \$10,000 at an annual interest rate of 7% compounded monthly. The corresponding monthly compounding factor is given by

$$1 + \frac{0.07}{12} = 1.0058 = \alpha.$$

(FYI, the annualized multiplier is $\left(1 + \frac{0.07}{12}\right)^{12} = 1.0723$.) You propose to pay back β per month starting at the end of the first month.

1. Let P_n be the amount you owe at the beginning of the $n'th$ month (taking into account the previous months interest charge and the payment β has been made. Write out the recursion equation expressing P_{n+1} in terms of P_n, α and β. (no number just the symbols).

2. Write out the first few terms P_1, P_2, P_3 in terms of P_0expressed in terms of P_0, α and β.

3. Find a closed form for P_n.

4. If you are to pay the loan off in 5 years, what should the payment β equal.

5. Suppose you are trying to tile a $3 \times n$ checkerboard with 1×2 dominos and 2×2. Let a_n be the number of distinct tilings. Find a_1, a_2, and a_3. Set up but do not solve the recurrence equation for a_n.