Finite Math

section 5.3 Annuities

Compound Interest Formula

\[ A = P \left( 1 + \frac{r}{m} \right)^{mn} = P \left( 1 + i \right)^n \]

where \( A \) = Account Value at time \( t \) years, \( t \) = time (in years)

\( P \) = principle, \( m \) = (annual) compounding frequency, \( r \) = (annual) interest rate,

\( i = \frac{r}{m} \) = periodic interest rate, \( n = m \cdot t \) = # periods

Ex1, $330 is deposited every 2 months where the first payment was made on Aug 30, 2002.
Second payment was deposited on Oct 30, 2002, and so on.
The last payment will be deposited on Dec 30, 2008.
Account is compounded every 2 months at an annual interest rate of 6%.

(a) How many deposits are there?

(b) Find the future value (on Dec 30, 2008) of $330 deposited on Aug 30, 2002. (payment #1)

(c) Find the future value (on Dec 30, 2008) of $330 deposited on Oct 30, 2002. (payment #2)

(d) Find the future value (on Dec 30, 2008) of $330 deposited on Oct 30, 2005. (payment #

(e) Find the future value (on Dec 30, 2008) of $330 deposited on Dec 30, 2008. (payment #

(f) Express the future value (value on Dec 30, 2008) of the account as a sum of future values of each deposit.
That is, each term must be a future value of one deposit. (Write first 3 terms, +...+, and the last 3 terms.)

(g) Find the future value in a concise numerical expression.
Ex2,  \$700 is deposited every month where the first payment was made on Oct 30, 2005.  
Second payment was deposited on Nov 30, 2005, and so on.  
The last payment will be deposited on Dec 30, 2007.  
Account is compounded monthly at an annual interest rate of 3\%.

(a) How many deposits are there?

(b) Find the future value (on Dec 30, 2007) of \$500 deposited on Oct 30, 2005.  (payment # 1)

(c) Find the future value (on Dec 30, 2007) of \$500 deposited on Nov 30, 2005.  (payment # 2)

(d) Find the future value (on Dec 30, 2007) of \$500 deposited on Nov 30, 2007.  (payment #  )

(e) Find the future value (on Dec 30, 2007) of \$500 deposited on Dec 30, 2007.  (payment #  )

(f) Express the future value (value on Dec 30, 2007) of the account as a sum of future values of each deposit.  
That is, each term must be a future value of one deposit.  (Write first 3 terms, +\ldots+, and the last 3 terms.)

(g) Find the future value in a concise numerical expression.  
(In other words, find the sum in (d), final calculation is not necessary)