EXTRA PRACTICE WITH EFFECTIVE INTEREST RATES

For the following problems, assume that the interest rate is 24% APR. Find the effective interest rate to match the payment frequency, if:

1. Compounding is quarterly, and payments are also made quarterly.

2. Compounding is semi-annually, and payments are made annually.

3. Compounding is monthly, and payments are made quarterly.

4. Compounding is monthly, and payments are made biennially (once every two years).

5. Compounding is monthly, and payments are made yearly.

6. Compounding is monthly, and payments are made once per decade.

7. Compounding is weekly, and payments are made yearly (assume 52 weeks per year).

8. Compounding is weekly, and payments are made quarterly (assume every quarter has the same number of weeks).

9. Compounding is weekly, and payments are made monthly (assume every month has the same number of weeks).

10. Assume the interest rate is 2.0154% per month (compounded monthly), and payments are made annually. (Check with #7.)

Remember, you can use the formula below for every case to solve the above problems, but you might have to be careful about how you use \( m \) and \( m_e \):

\[
i_e = \left(1 + \frac{r}{m}\right)^{m_e} - 1
\]

where:

- \( r \) = nominal interest rate (per year) in decimal form
- \( m \) = number of compounding periods per year
- \( m_e \) = number of compounding periods per payment period

and

- \( i_e \) = effective interest rate per payment period in decimal form.