**EMF**
**matematyka, I rok, I stopień**
**lista 6**
*renty*

Zadania z podręcznika Kellisona

1. Payments of \$100 per quarter are made from June 7, Z, through December 7, Z + 11, inclusive. If the nominal rate of interest convertible quarterly is 6%:

   a) Find the present value on September 7, Z - 1.

   b) Find the current value on March 7, Z + 8.

   c) Find the accumulated value on June 7, Z + 12.

2. Show that
$$\sum_{t=10}^{15} (\ddot{s}_{\overline{t}|} - s_{\overline{t}|}) = s_{\overline{16}|} - s_{\overline{10}|} - 6.$$

3. Annuities X and Y provide the following payments:

| End of Year | Annuity X | Annuity Y |
|---|---|---|
| 1-10 | 1 | K |
| 11-20 | 2 | 0 |
| 21-30 | 1 | K |

   Annuities X and Y have equal present values at an annual effective interest rate $i$ such that $v^{10} = \frac{1}{2}$. Determine K.

4. At an annual effective interest rate $i$ it is known that:

   - the present value of 2 at the end of each year for 2n years, plus additional 1 at the end of the first n years, is 36;
   - the present value of an n-year deferred annuity-immediate paying 2 per year for n years is 6.

   Find $i$.

5. Simplify $a_{\overline{15}|}(1 + v^{15} + v^{30})$ to one symbol.

6. Deposits of \$1000 are placed into a fund at the beginning of each year for the next 20 years. After 30 years annual payments commence and continue forever, with the first payment at the end of the 30th year. Find the expression for the amount of each payment.

7. A loan of \$1000 is to be repaid by annual payments od \$100 to commence at the end of the fifth year and to be continue thereafter for as long as necessary. Find the time and amount of the final payment, if the final payment is to be larger than the regular payments. Assume $i = 4,5\$$

8. A fund of \$2000 is to be accumulated by n annual payments of \$50, followed by n annual payments \$100, plus smaller final payment made one year after the last regular payment. If the effective rate of interest is 4,5%, find n and the amount of the final irregular payment.

9. A borrower has the following two options for repaying a loan:

   - sixty monthly payments of \$100 at the end of each month;
   - a single payment of \$6000 at the end of K months.

   Interest is at the nominal annual rate of 12% convertible monthly. The two options have the same present value. Find K.

Zadania ze zbioru zadań Podgórskiej i inne