INTEREST CALCULATIONS

One application of functions is to perform various complicated (tedious) tasks for us. For example a mortgage calculation is a complicated to do by hand, but we can make the computer do the calculation for us using JavaScript.

DEFINITIONS

Consider a mortgage payment calculation.

```javascript
// n = number of years  # not used
// k = number of months
// S = initial sum borrowed
// P = monthly payment amount
// I = monthly interest rate (= 1/12-th of the nominal annual percentage rate (I=0.05 for nAPR of 6%)
// Zr(k,S,I,P) = amount owed after k-th payment P on a monthly loan of initial amount S at interest rate

Zr = function (k, S, I, P) {
    if (k == 0) { return S; }
    return Zr(k-1,S,I,P)+S/(1+I)-P;
}
```

EXAMPLE CALCULATIONS

For a loan of 1000 the money owed after zero months:

After one months has passed, and a payment of 100 has been made:

After two months, you owe:

MONTHLY PAYMENT CALCULATION

Zr(0,1000,0.005,100) // 0% nAPR = 0.005% monthly
1000

Zr(1,1000,0.005,100) // 0% nAPR = 0.005% monthly
905.00
// the interest for one month was $5 but a payment of $100 cut the sum down a bit

Zr(2,1000,0.005,100)
809.5249999999997
Assuming a 25 year mortgage of $315000, we can manually plug different values of the payment until we find the payment amount P which reduces the amount owed to zero after 25*12 months.

The monthly payment for a 3% nominal annual percentage rate is $1497.77

The monthly payment for a 4% nominal annual percentage rate is $1662.69

The monthly payment for a 5% nominal annual percentage rate is $1841.54

The monthly payment for a 6% nominal annual percentage rate is $2029.55

**EXERCISE**

Ajouter condo fees ?? et taxes ville de montreal + taxes scolaires.

**THIRD-OF-A-MILLION DOLLAR QUESTION**

Assuming interest rate goes up to 5%, condo fees + taxes of 300, can your rent that condo for 2141.54 par mois pour couvrir les fairs.