

### Even more exercises . . . ☺

(Gee, and I already feared I would have to go to this dreary party tonight!)

#### **Exercise 1**

Two debtors each owe \$100,000 at an annual interest rate of 8%. Debtor A chooses a constant reduction amortization (the first annuity being \$20,500), debtor B prefers a constant annuity plan (annual payments of \$40,000). How long will both debtors take to annul their debt?

#### **Exercise 2**

Another debtor owes SHARK Bank Ltd. a total of \$25,000 that he is supposed to pay back with two payments of \$20,000 after one resp. two years. Compute the effective annual interest rate used by SHARK Bank Ltd.!

#### **Exercise 3**

Complete the following “arbitrary” amortization plan using whatever information is already provided:

| Year $k$ | Residual debt<br>$L_{k-1}$ | Interest<br>$I_k$ | Debt reduction<br>$R_k$ | Annuity<br>$A_k$ |
|----------|----------------------------|-------------------|-------------------------|------------------|
| 1        | 100,000                    | 12,000            |                         | 22,000           |
| 2        |                            |                   | 52,000                  |                  |
| 3        |                            |                   |                         | 22,560           |
| 4        |                            |                   |                         |                  |
| 5        | 0                          |                   |                         |                  |

#### **Exercise 4**

Which of the following amortization plans would you say is more customer-friendly (using, of course, a well-established mathematical technique; in both cases, the debtor owes \$100,000) ?

- Ten annual payments of \$12,000, beginning after one year
- A single payment of \$140,000 after ten years

#### **Exercise 5**

\$23,800 is being invested at 12% nominal annual interest rate (compounded monthly).

- Compute the future value after seven years!
- Compute the effective annual interest rate!

. . . admittedly, that is an easy job . . .

#### **Exercise 6**

Explain in your own words why it is impossible to design a “constant interest” amortization scheme where the interest to be paid annually does not vary with time!