

Investing money

- 1000\$ was invested at the beginning of the year. The bank offers 2% interest rate and the interest is compounded yearly.
 - What is the value of the investment after 5 years?
 - After how many years will the value of the investment exceed 5000\$?
 - How much money must be invested under the same conditions to have 3000\$ in 10 years?
 - What is the minimum interest rate to have 2000\$ in 10 years if 1000\$ was invested? Give the answer in percent, to 2 decimal places.
- 50000PLN was invested at the beginning of the year. The bank offers 3% interest rate and the interest is compounded monthly.
 - What is the value of the investment after 10 years?
 - After how many years will the value of the investment exceed 100000PLN ? Give the answer in full years and months.
 - How much money must be invested under the same conditions to have 100000PLN in 10 years? Give the answer to the nearest PLN.
 - What is the minimum interest rate to have 100000PLN in 10 years if 50000PLN was invested? Give the answer in percent, to 2 decimal places.
- Arrange the investments below from the most profitable to the least profitable.

Bank A: the interest rate is 3%, the interest is compounded yearly,
Bank B: the interest rate is 2,99%, the interest is compounded quarterly,
Bank C: the interest rate is 2,98%, the interest is compounded monthly,
Bank D: the interest rate is 2,97%, the interest is compounded continuously.
- A bank account gives 2.5% interest rate with the interest calculated monthly. What is the equivalent yearly interest rate? What would it be if the interest was compounded continuously?
- At the beginning of each month you invest 500PLN. The interest rate is 2% and the interest is compounded monthly.
 - What is the value of the investment after 2 years?
 - When will this investment enable you to buy a car worth 20000PLN? Give the answer in full years and months.
 - How much money do you need to invest monthly to buy the car in 3 years? Give the answer to the nearest PLN.
 - What is the minimum yearly interest rate that would enable you to buy the car in 3 years if you invested 500PLN monthly? Give the answer in percent, to 2 decimal places.
- At the beginning of each month you invest 10000\$. The interest rate is 0.5% and the interest is compounded monthly.
 - What is the value of the investment after 15 years?
 - When will this investment enable you to buy a house worth 300000\$? Give the answer in full years and months.
 - How much money do you need to invest monthly to buy the house in 15 years? Give the answer to the nearest dollar.
 - What is the minimum yearly interest rate that would enable you to buy the house in 15 years if you invested 1000\$ monthly? Give the answer in percent, to 2 decimal places.

7. To buy a flat worth 150000PLN you decided to take a mortgage credit. You are going to repay 2000PLN monthly and the monthly instalment rate is 0,7%.
- (a) What is the remaining debt after 5 years? Give the answer to the nearest PLN.
 - (b) When will you repay the whole loan? Give the answer in full years and months.
 - (c) What is the cost of the loan (your own money to pay)? Give the answer to the nearest PLN.
 - (d) How much do you need to pay monthly if you want to repay the sum in 5 years?
 - (e) What should the maximum instalment rate be if you want to repay the loan in 10 years, with monthly instalments of 2000PLN? Give the answer in percent, to 2 decimal places.
 - (f) What is the minimum amount you need to repay each month to make this loan repayable? Give the answer to 2 decimal places.
 - (g) From the opposite perspective, if you are a banker then you treat credits as investments. So if you lend 150000PLN and it will bring the profit found in (c) in the number of months found in (b), what is the equivalent yearly interest rate for such an investment? Give the answer in percent.
8. Solve the previous task once again assuming that you will repay monthly the minimum necessary amount, found in (f).
9. You are offered 20000\$ which you can invest. Assume that the interest rate is 5% and the interest is compounded yearly. You are also offered 1000\$ yearly for the next 30 years and you can invest this money in the same way as before. If both investments are going to begin at the same moment, which option is more profitable in long term? What about a longer term, say, 80 years?