Financial Mathematics 2017/2018

Exercises 1

1. Calculate the amount of interest that will be paid on an investment of 6 000 PLN at 9% simple interest per annum for 6 years and 4 months.
2. A bank charges simple interest at a rate of 6% p.a. on a 90-day loan of 10 000 PLN. Calculate the interest.
3. Suppose you put 1 000 PLN in a savings account paying simple interest at 4% per annum for two years. Then, you withdraw the money with interest and put it for a half of year in another account paying simple interest at 5%. How much do you have in the end?
4. How many quarters does it take for 400 PLN to accumulate to 2 000 PLN under 8% p.a. simple interest?
5. Calculate the time taken for 2000 PLN to earn 50 PLN at 5% simple interest.
6. Find the simple interest rate if principal increases five times in twenty years.
7. Calculate the difference between the simple interest and the compound interest on a loan of 2 000 PLN at 7.5% per annum over 5 years.
8. Calculate the final amount if 4500 PLN is invested at 6% compound interest per annum for 10 years.
9. Suppose that you save 1 000 PLN in an account that pays 3% interest every quarter. How much do you have in one year? Compound interest is used.
10. Calculate the amount of compound interest earned from investing 8 000 PLN at 8% per annum for 3 years.
11. How much do you need to invest now to get 5000 PLN after two years if the interest rate is $5\frac{1}{2}\%$. Compound interest is used.
12. Suppose that 2 000 PLN is invested at 2.5% per annum, compounding monthly. How much interest is paid in the fourth year of investment?
13. How long does it take to double your capital if you put it in an account paying compound interest rate at a rate of $4\frac{3}{4}\%$? What if the account pays simple interest? What if the account pays continuously compounded interest?
14. Compute the nominal interest rate per annum payable monthly that is equivalent to the simple interest rate of 9% per annum over a period of nine months.
15. Calculate the final amount if 3 500 PLN is invested at 5% continuously compounded interest for 5 years.
16. What is the present value of 8 000 PLN to be received in 6 years using 9% continuous discounting?
17. Suppose that an account offers a nominal interest rate of 6% p.a. payable monthly. What is effective interest rate? What if nominal rate is the same, but interest is payable daily? Weekly? Quarterly?
18. Compare the following three loans: a loan charging 10% compounded monthly, a loan charging 11% compounded quarterly, a loan charging an annual effective rate of 10.5%.