



Simple interest

1. The amount of 100 million NOK was deposited at a simple interest rate of 10% per annum for 2.5 years. Then the accumulated amount was put under a simple interest of 16% per annum for the following m months. At the end of the term, they received the accumulated amount of 140 million NOK. What is the value of m ?
2. With an interest rate of 25% per annum, on January 15, 2022, the amount of 10,000 NOK was deposited into the bank account. From March 1, 2022, the interest rate on the contribution was 30% per annum. On March 10, 2022, the account was closed, 5,000 NOK was added to the amount received. and a new account was opened in the same bank. From 05/15/2022, the interest rate on the contribution was 20% per annum. On 05/25/22, the account was closed. Find the amount. Bank uses a simple interest.

2022													
January				February				March					
S	M	Tu	W	Th	F	Sa	S	M	Tu	W	Th	F	Sa
							1	2	3	4	5		
2	3	4	5	6	7	8	6	7	8	9	10	11	
9	10	11	12	13	14	15	13	14	15	16	17	18	
16	17	18	19	20	21	22	20	21	22	23	24	25	
23	24	25	26	27	28	29	27	28	29	30	31	1	
30	31						2	3	4	5	6	7	
							8	9	10	11	12	13	
							14	15	16	17	18	19	
							20	21	22	23	24	25	
							26	27	28	29	30	31	

3. A sum of \$9, 000 paid into a bank account for two months (61 days) to attract simple interest will produce \$9, 020 at the end of the term. Find the interest rate r and the return on this investment.

Periodic Compounding

4. How long will it take to double a capital attracting interest at 6% compounded daily?
5. Find the present value of 100,000 NOK to be received after 100 years if the interest rate is assumed to be 5% throughout the whole period and a) daily or b) annual compounding applies.
6. Which variant is better: a deposit of 20 thousand NOK for 1 month at 12% interest or for 6 months at 12.2%?

Continuous compounding

7. In the amount of 2.000 \$ for 5 years compounded continuously % with the power of growth $\delta = 10\%$. Find the accumulated capital, the growth factor and the corresponding compound rate.
8. In 1626 Peter Minuit, governor of the colony of New Netherland, bought the island of Manhattan from Indians paying with beads, cloth, and trinkets worth \$24. Find the value of this sum in year 2018 at 5% compounded a) continuously and b) annually.
9. Find the present value of 1 million NOK, which will be paid in 20 years with continuous interest with a growth rate of 6%. What will be the effective compound interest rate?

Cash Flow

9. Calculate the present value of an ordinary annuity of amount \$100 paid annually for 5 years at the rate of interest of 9%.
10. Calculate the present value of an ordinary annuity of amount \$100 payable quarterly for 10 years at the annual rate of interest of 8% convertible quarterly. Also calculate its future value at the end of 10 years.
11. Ellen is 35 years old, and she has decided it is time to plan seriously for her retirement. At the end of each year until she is 65, she will save \$10,000 in a retirement account. If the account earns 10% per year, how much will Ellen have saved at age 65?
12. Find a formula for the present value of an infinite stream of payments of the form $C; C(1 + g); C(1 + g)^2; \dots$, growing at a constant rate g . Find a formula for the present value of n such payments.
13. The client enters into an agreement with the bank to pay him an annual fee of 10,000 NOK at the beginning of each year for 5 years. How much payment will he have to make at the beginning of the first year in order to secure this annuity, given that the annual interest rate is 20%?
14. A man wants to save \$100,000 to pay for his son's education in 10 years' time. An education fund requires the investors to deposit equal installments annually at the end of each year. If interest of 7.5% is paid, how much does the man need to save each year in order to meet his target?
15. Experts assume that the effective annual interest rate will be 10% in the first 5 years, 6% in the next 5 years. A person buys a 10-year annuity with a payment of 1,000 NOK at the end of each year. Calculate the price of such an annuity.