

## Chapter 3

# Mathematics of Finance

### 3.1 Proportions and Percentages. Simple Interest

#### Exercises

1. Rye bread contains 42% water. How much water is there in 2.5 kg of the rye bread?
2. Planned monthly trade of a shop is 84,000 €. The plan is accomplished 12.5%. What amount is traded?
3. Price of a product with a 2.25% discount is 72 €. What is the original price?
4. Export of a good has increased from 648,000 t last year to 793,800 t this year. What is the percentual increase?
5. Determine the price of a product which after an increase of 12% increased by 27 €.
6. How much kilometers will a car pass if it has 17.5 liters of carburant left in his tank and it spends 6.6 liters in 100 kilometers.

7. Price of a product after an increase by 8% is 135 €. What was the price before the increase and what is the interest?
8. After a 10% discount, a good is sold for 234 €.
  - (a) What is the discounted amount?
  - (b) What was the price before the discount?
  - (c) What would the selling price be if it were discounted by 22%?
9. Price of a product with a gross profit margin of 18% is 10.03 €. If the same product is sold for a price of 7.48 €, does it generate a profit or a loss? What is the percentage of the profit or the loss?
10. If a product is sold for 2,442 €, it generates a loss of 7.5%. What would the price be if the product generated a profit of 12.5%?
11. Price of fabric for a dress is decreased by 8%, and then the new price is decreased by 12%. After the second decrease, the price of the fabric is 20.24 € a meter. Calculate the price before the second decrease and the original price.
12. An amount of 10,000 € is invested for 6 years at an annual simple interest rate of 16%.
  - (a) How much interest will be earned?
  - (b) What is the future value of the investment at the end of the 6 years?
13. An amount of 1,000 € is invested for 3 months at an annual simple interest rate of 12%.
  - (a) How much interest will be earned?
  - (b) What is the future value of the investment at the end of the 3 months?
14. If you borrow 800 € for 6 months at 16% annual simple interest, how much must you repay at the end of the 6 months?
15. Mrs. Edwards lent 2,500 € to her son for 7 months at 9% annual simple interest. What is the future amount of this loan?

16. Find the interest on a loan of 5,000 €, given that the interest rate is 9% per year and the term of the loan is 6 months.
17. A farmer has an opportunity to lease an additional field to plant soybean crop. The lease of the land will cost 6,000 €, which must be paid in advance. Seed, fertilizer, herbicide, and other costs associated with planting the additional field will amount to 9,000 €. The farmer estimates that he can sell the crop for 17,800 €. The farmer has no excess cash, and he will need to borrow for 8 months the 15,000 € necessary to produce the crop. What interest rate per year can he afford to pay and still make a profit of at least 1,000 €?