

6.1.1: Simple and Compound Interest (Exercises)

SECTION 6.1 PROBLEM SET: SIMPLE INTEREST AND DISCOUNT

Do the following simple interest problems.

1) If an amount of \$2,000 is borrowed at a simple interest rate of 10% for 3 years, how much is the interest?	2) You borrow \$4,500 for six months at a simple interest rate of 8%. How much is the interest?
3) John borrows \$2400 for 3 years at 9% simple interest. How much will he owe at the end of 3 years?	4) Jessica takes a loan of \$800 for 4 months at 12% simple interest. How much does she owe at the end of the 4-month period?
5) If an amount of \$2,160, which includes a 10% simple interest for 2 years, is paid back, how much was borrowed 2 years earlier?	6) Jamie just paid off a loan of \$2,544, the principal and simple interest. If he took out the loan six months ago at 12% simple interest, what was the amount borrowed?
7) Shanti charged \$800 on her charge card and did not make a payment for six months. If there is a monthly charge of 1.5%, how much does she owe?	8) A credit card company charges 18% interest on the unpaid balance. If you owed \$2000 three months ago and have been delinquent since, how much do you owe?

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Do the following simple interest problems.

9) An amount of \$2000 is borrowed for 3 years. At the end of the three years, \$2660 is paid back. What was the simple interest rate?	10) Nancy borrowed \$1,800 and paid back \$1,920, four months later. What was the simple interest rate?
11) Jose agrees to pay \$2,000 in one year at an interest rate of 12%. The bank subtracts the discount of 12% of \$2,000, and gives the rest to Jose. Find the amount of the discount and the proceeds to Jose.	12) Tasha signs a note for a discounted loan agreeing to pay \$1200 in 8 months at an 18% discount rate. Determine the amount of the discount and the proceeds to her.
13) An amount of \$8,000 is borrowed at a discount rate of 12%, find the proceeds if the length of the loan is 7 months.	14) An amount of \$4,000 is borrowed at a discount rate of 10%, find the proceeds if the length of the loan is 180 days.
15) Derek needs \$2400 new equipment for his shop. He can borrow this money at a discount rate of 14% for a year. Find the amount of the loan he should ask for so that his proceeds are \$2400.	16) Mary owes Jim \$750, and wants to repay him. Mary decides to borrow the amount from her bank at a discount rate of 16%. If she borrows the money for 10 months, find the amount of the loan she should ask for so that her proceeds are \$750?

SECTION 6.1 PROBLEM SET: COMPOUND INTEREST

Do the following compound interest problems involving a lump-sum amount.

17) What will the final amount be in 4 years if \$8,000 is invested at 9.2% compounded monthly.?	18) How much should be invested at 10.3% for it to amount to \$10,000 in 6 years?
19) Lydia's aunt Rose left her \$5,000. Lydia spent \$1,000 on her wardrobe and deposited the rest in an account that pays 6.9% compounded daily. How much money will she have in 5 years?	20) Thuy needs \$1,850 in eight months for her college tuition. How much money should she deposit lump sum in an account paying 8.2% compounded monthly to achieve that goal?
21) Bank A pays 5% compounded daily, while Bank B pays 5.12% compounded monthly. Which bank pays more? Explain.	22) EZ Photo Company needs five copying machines in 2 1/2 years for a total cost of \$15,000. How much money should be deposited now to pay for these machines, if the interest rate is 8% compounded semiannually?

23) Jon's grandfather planned to give him \$12,000 in 10 years. Jon has convinced his grandfather to pay him \$6,000 now, instead. If Jon invests this \$6,000 at 7.5% compounded continuously, how much money will he have in 10 years?

24) What will be the price of a \$20,000 car in 5 years if the inflation rate is 6%?

SECTION 6.1 PROBLEM SET: COMPOUND INTEREST

Do the following compound interest problems.

25) At an interest rate of 8% compounded continuously, how many years will it take to double your money?

26) If an investment earns 10% compounded continuously, in how many years will it triple?

27) The City Library ordered a new computer system costing \$158,000; it will be delivered in 6 months, and the full amount will be due 30 days after delivery. How much must be deposited today into an account paying 7.5% compounded monthly to have \$158,000 in 7 months?

28) Mr. and Mrs. Tran is expecting a baby girl in a few days. They want to put away money for her college education now. How much money should they deposit in an account paying 10.2% so they will have \$100,000 in 18 years to pay for their daughter's educational expenses?

29) Find the effective interest rate for an account paying 7.2% compounded quarterly.

30) If a bank pays 5.75% compounded monthly, what is the effective interest rate?

31) The population of the African nation of Cameroon was 12 million people in the year 2015; it has been growing at a rate of 2.5% per year. If the population continues to grow at a rate, what will the population be in 2030?
(<http://databank.worldbank.org/data on 4/26/2016>)

32) According to the Law of 72, if an amount grows at an annual rate of 1%, then it doubles every seventy-two years. Suppose a bank pays 5% interest, how long will it take for you to double your money? How about at 15%?

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