

Lesson 1.5 • Loans and Investments

Name _____ Period _____ Date _____

1. Assume that each of the sequences below represents a financial situation. Indicate whether each represents a loan or an investment, and give the principal and the deposit or payment amount.

a. $u_0 = 1000$

$$u_n = (1 + 0.04)u_{n-1} + 100 \quad \text{where } n \geq 1$$

b. $u_0 = 15500$

$$u_n = \left(1 + \frac{0.06}{2}\right)u_{n-1} - 475 \quad \text{where } n \geq 1$$

c. $u_0 = 130000$

$$u_n = \left(1 + \frac{0.0625}{4}\right)u_{n-1} - 1055 \quad \text{where } n \geq 1$$

d. $u_0 = 1825$

$$u_n = \left(1 + \frac{0.075}{12}\right)u_{n-1} + 120 \quad \text{where } n \geq 11$$

2. For each financial situation represented by a sequence in Exercise 1, give the annual interest rate and the frequency with which interest is compounded.

3. Find the first month's interest on each loan.

- a. \$20,000 loan; 6% annual interest rate
- b. \$1,650 loan; 4.6% annual interest rate
- c. \$122,750 loan; 5.75% annual interest rate
- d. \$49,200 loan; 7.3% annual interest rate

4. Write a recursive formula for each financial situation.

- a. You invest \$5,000 at 5%, compounded quarterly, and deposit an additional \$400 every 3 months.
- b. You take out a car loan for \$12,500 at 7.5%, compounded monthly, and you make monthly payments of \$350.
- c. You take out a home mortgage for \$144,500 at 6.2%, compounded monthly, and make monthly payments of \$990.
- d. You enroll in an investment plan through your job that deducts \$225 from your monthly paycheck and deposits it into an account with an annual interest rate of 3.75%, compounded monthly.