

Financial Mathematics

Name: _____

Date: _____

Concepts

- Compound Interest Rates
 - Simple Interest Rates
 - Financial Mathematics
 - Solving Problems in Financial Mathematics
-

Compound Interest Rates

1. Kenji deposits \$2500 in an account paying 4% per year, compounded annually. He makes no other deposit and no withdrawal for 6 years. Find the value of the account after 6 years and the total interest earned. Round to the nearest cent.

2. Sabrina has \$4000 to place for 5 years. The Banque du Nord offers 6% per year compounded quarterly; the Caisse de l'Est offers 6.1% per year compounded annually. Determine which institution returns more, and by how much.

Financial Mathematics

3. Nadia deposits \$1800 in an account paying a nominal rate of 3.5% per year, compounded semi-annually, and leaves it for 4 years.

- a) State the capital C , the periodic interest rate i and the number of interest periods n .
- b) Explain, in one or two sentences, the difference between the nominal annual rate and the periodic rate.
- c) Find the final value of the account and the interest it earned.

4. Ophélie wants \$10 000 available in 8 years for a study exchange.

- a) How much must she deposit today in an account paying 5% per year compounded annually?
- b) Without computing first, predict whether she would have to deposit more or less if the same 5% were compounded monthly. Then verify by computing the amount.

Simple Interest Rates

5. A community fund lends \$3200 at a simple interest rate of 5.25% per year for 3 years. Find the interest owed and the total amount to be repaid.

6. Léa borrows \$1450 from a credit union at 7.2% simple interest per year and repays the loan in full after 8 months. The credit union also charges a \$25 file-opening fee, payable at the end with the loan.
- a) How much interest does she pay?
 - b) What total amount does she hand over?
 - c) What single simple annual rate, applied over the same 8 months and with no fee, would have cost her exactly the same? Round to the nearest hundredth of a percent.

Solving Problems in Financial Mathematics

7. A cooperative can place \$5000 for 3 years in one of two accounts: account A pays 6.5% simple interest per year, account B pays 6% per year compounded annually. Which account yields more, and by how much?

8. A bakery is replacing an oven. The supplier proposes two ways to pay:

- a) pay \$7200 in cash today; or
- b) pay \$2000 today and \$5600 in 3 years.

The bakery's money earns 5% per year compounded annually. Determine which proposal costs the bakery less, and express the saving in today's dollars.

Synthesis — drawing on several sheets in this topic

9. Étienne must have \$9000 available in exactly 6 years to redo the roof of his cabin. He is considering two ways of getting there.

- a) Plan 1: a single deposit today in an account paying 4.8% per year compounded semi-annually. How much must he deposit?
- b) Plan 2: depositing \$7000 today in an account paying simple interest. What annual rate would that account have to pay? Round to the nearest hundredth of a percent.
- c) Which plan requires less money from him today, and by how much?

Want the harder problems and the worked solutions?

The *Challenge Problems* set and the *Answer Keys* for Financial Mathematics — with the reasoning written out in full — are available at tutorinmontreal.ca.