

2.3 Compare investment growth and stated loan schedules

Name: _____ Class: _____ Date: _____

Total: 24 marks

KEY WORDS simple interest 单利 • compound interest 复利 • principal 本金

Objective

Compare investment growth and stated loan schedules. Original GAC004-aligned practice, not an official assessment. Show the method as well as the result. All applied scenarios are invented classroom problems.

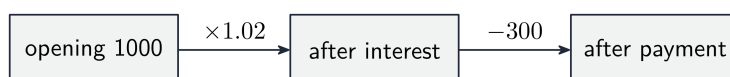
1 Key knowledge and worked examples

■ **Key knowledge:** a rate has a period and a loan balance changes after payments

Principal 本金 is the initial amount invested or borrowed. **Simple interest** 单利 uses $I = Prt$ at a stated rate r per period and time t in matching periods. **Compound interest** 复利 uses $A = P(1 + r)^n$ when the rate and compounding period match and no other cash flows apply.

For the loan convention used here, interest is added to the opening balance and a payment is then subtracted: $B_n = B_{n-1}(1 + r) - M$. A final payment may need adjustment to avoid a negative balance. Compare total payments and fees under the same stated schedule. All examples use invented classroom terms, with no actual lending or investment advice.

■ **Worked example:** interest then payment, in that order



Known: opening balance 1000 units, period rate 2%, end-of-period payment 300 units. Interest comes before payment under this stated convention.

$$B_1 = B_0(1 + r) - M$$

$$B_1 = 1000(1.02) - 300 = 720$$

The next period's interest uses 720, not the original principal.

$$B_2 = B_1(1 + r) - M = 720(1.02) - 300 = 434.40$$

2 Practice

2.1 Find the simple interest on 800 units at 5% per year for 3 years. [2]

2.2 Find the value of 800 units after 2 years at 5% compounded annually, with no other cash flows. [2]

2.3 A nominal teaching rate is 12% per year, compounded monthly at 1% per month. Find the value of 1000 units after 6 months, to 2 decimal places. [3]

2.4 A loan opens at 600 units. Each month adds 1% interest before a 100-unit payment. Find the balances after the first two months. [3]

3 Exam-style questions

3.1 Two investments start with 2000 units. A pays simple interest at 6% per year for 3 years. B pays 5.5% compounded annually for 3 years. There are no charges or other cash flows. Find each final value and the difference to 2 decimal places. State which final value is higher under these assumptions. [6]
