

Exercise walk-through

3.2.2

Percentage Growth

AQA · GCSE · Mathematics

54. Simple interest, compound growth and decay · Foundation

Simple interest, compound growth and decay · Foundation

A percentage r corresponds to decimal $r/100$; increases use multiplier $1+r/100$ and decreases $1-r/100$. Simple interest on principal P for n periods at rate r is $Pn/100$, giving balance $P(1+rn/100)$. Compound balance is $P(1+r/100)^n$. Decay uses the corresponding decreasing multiplier. Use matching rate and period units, and divide by the multiplier to recover an original value.

56. Simple interest, compound growth and decay · Foundation

Simple interest, compound growth and decay · Foundation

At 10% per year, 1000 yuan earns simple interest 100 per year: after two years interest is 200 and balance is 1200. Compound balances are 1100 after year one and 1210 after year two. A machine worth 800 yuan losing 20% each year becomes 640 then 512, not 480: the second loss is 20% of 640. An 800-yuan sale price after a 20% reduction corresponds to original price $800/0.8=1000$. Growth from 50 to 65 is $(65-50)/50 \times 100 = 30\%$; 65 is 130% of 50. If a compound balance must first exceed 1300 at 10%, year two gives 1210 and year three 1331, so three whole years are needed.

60. Iterative processes with repeated deposits · Higher

Iterative processes with repeated deposits · Higher

Write an update rule and an initial value. Apply the operations in their stated order, using the previous output as the next input. A recurrence $B_{\text{next}} = 1.1B + 50$ differs from $1.1(B + 50)$. Tables can locate a first whole-period threshold; verify both the preceding and crossing values. Iteration can model growth, decay or other repeated processes, not just solve equations.

Exercises 2.1·2.3

2.1 (Foundation) Find a 1000-yuan balance after two years at 10% compound annual interest.

2.2 (Foundation) Find an 800-yuan value after two annual 20% reductions.

2.3 (Foundation) Find total simple interest on 1000 yuan at 10% for two years.

3 Exam-style questions

Exercises 2.1·2.3

2.1 (Foundation) Find a 1000-yuan balance after two years at 10% compound annual interest.

2.1 $1000 \times 1.1^2 = 1210$.

2.2 (Foundation) Find an 800-yuan value after two annual 20% reductions.

2.2 $800 \times 0.8^2 = 512$.

2.3 (Foundation) Find total simple interest on 1000 yuan at 10% for two years.

3 Exam-style questions

2.3 $1000 \times 0.10 \times 2 = 200$; interest is separate from balance.

Exercise 3.1

3.1 Decide whether this claim is true. Justify with a concrete calculation or counterexample: Simple and compound interest always give the same balance after two years.

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3.1 False. At 10% annually on 1000, simple interest gives 1200 after two years; compound interest gives $1000 \times 1.1^2 = 1210$.

Local review guidance: show the chosen method; give the checked result; explain the condition or failed shortcut. This is authored classroom guidance.