Compound interest

6 questions | 15 marks

Equivalent correct methods earn the corresponding marks.

1. Find the total of 1000 dollars after 2 years at 4% annual compound interest. [2 marks]

$1000(1.04)^2 = 1081.6.$

Answer: 1081.60 dollars

2. Find the interest in that model. [2 marks]

Subtract the original 1000 dollars.

Answer: 81.60 dollars

3. Find the one-year balance of 4000 dollars at nominal 8% annually compounded quarterly. Round to cents. [3 marks]

$4000(1 + \frac{0.08}{4})^4 = 4329.72864.$

Answer: 4329.73 dollars

4. Give the rate and exponent for nominal 12% annually compounded monthly over 18 months. [2 marks]

$\frac{0.12}{12} = 0.01$ and the duration is already in months.

Answer: 1% monthly; exponent 18.

5. An annual-compounding model grows 2500 dollars to 3025 dollars in 2 years. Find its rate. [3 marks]

$(1 + r)^2 = 1.21$; the positive factor is 1.1.

Answer: 10% annually

6. Why is 5% nominal annual interest compounded monthly different from 5% effective annually? [3 marks]

$(1 + \frac{0.05}{12})^{12} > 1.05.$

Answer: Monthly interest itself earns interest during the year.