Savings/loan scenarios with supplied models

6 questions | 16 marks

Equivalent correct methods earn the corresponding marks.

1. Use $B_{n+1} = 1.04B_n + 50$ from $B_0 = 200$. Find B_1. [2 marks]

$1.04(200) + 50 = 258$.

Answer: 258 dollars

2. Continue that model to its second close. [2 marks]

$1.04(258) + 50 = 318.32$.

Answer: 318.32 dollars

3. Use $L_{n+1} = 1.02L_n - 100$ from $L_0 = 600$. Find two closes. [3 marks]

$600(1.02) - 100 = 512$; $512(1.02) - 100 = 422.24$.

Answer: 512 dollars; 422.24 dollars.

4. A 100-dollar deposit is made before 5% interest on 1000 dollars. Compare with an end deposit. [3 marks]

Before: $(1000 + 100)(1.05) = 1155$. End: $1000(1.05) + 100 = 1150$.

Answer: 1155 dollars before; 1150 dollars at the end.

5. A 2000-dollar opening loan balance gains 1% interest, then a 300-dollar payment is made. How much does the amount owed fall below its original value? [3 marks]

Interest is 20 dollars, so the reduction below 2000 is $300 - 20 = 280$.

Answer: 280 dollars

6. Why does repayment before interest need a different formula? [3 marks]

That ordering gives $(L_n - R)(1 + i)$, not $L_n(1 + i) - R$.

Answer: It reduces the amount on which interest is charged.