LESSON MAKER PRO

Interest and Choices

Compare the cost of buying now and planning ahead.

HIGH SCHOOL · MA.912.FL.3.2

MA.912.FL.3.2 "Solve real-world problems involving simple, compound and continuously compounded interest."

NAME _____ DATE _____

INTEREST FORMULAS

For simple interest, use $I=Prt$, then find the total with $A=P+I$. For compound interest, use $A=P(1+r/n)^{(nt)}$, and for continuous interest, use $A=Pe^{(rt)}$. In each formula, P is the starting amount, r is the annual rate as a decimal, t is time in years, and n is the number of compounding periods per year.

WORKED EXAMPLE

Find the total amount for $350 invested at 7% simple interest for 2 years.

1. Convert the rate: 7%=0.07.
2. Find the interest: $I=350(0.07)(2)=49$.
3. Add the interest: $A=350+49=399$.

Answer: $399

PRACTICE 6 problems

1 How much simple interest does $250 earn at 8% for 3 years?

ANSWER _____

2 Find the total amount of $900 invested at 5% simple interest for 4 years.

ANSWER _____

3 Find the total amount of $500 invested at 10% compounded annually for 3 years.

ANSWER _____

4 A $1,000 balance earns 12% annual interest compounded monthly for one month. Find the new balance.

ANSWER _____

5 Write the exact accumulated amount for $300 invested continuously at 4% for 5 years.

ANSWER _____

6 An $800 balance grows to $968 with simple interest after 4 years. What annual interest rate was used?

ANSWER _____

APPLY IT Show your work

1 A laptop has a cash price of $600. A store lets you finance it for one year at 6% simple interest. How much will you pay in all, and how much more is that than paying the cash price?

WORK SPACE

ANSWER _____

2 You plan to buy a used car in 3 years. You deposit $2,000 in an account that pays 5% interest compounded annually. How much money will be in the account, and how much interest will you earn?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A $1,000 purchase will be paid in one lump sum after 3 years. Plan A charges 10% simple interest. Plan B charges 10% interest compounded annually. Which plan costs less? Give both total costs, the difference, and explain why.

WORK SPACE AND ANSWER

ANSWER KEY

Interest and Choices

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	How much simple interest does $250 earn at 8% for 3 years?	**$60**
2	Find the total amount of $900 invested at 5% simple interest for 4 years.	**$1,080**
3	Find the total amount of $500 invested at 10% compounded annually for 3 years.	**$665.50**
4	A $1,000 balance earns 12% annual interest compounded monthly for one month. Find the new balance.	**$1,010**
5	Write the exact accumulated amount for $300 invested continuously at 4% for 5 years.	**$300e$^{0.20}$**
6	An $800 balance grows to $968 with simple interest after 4 years. What annual interest rate was used?	**5.25%**

PART 2 · APPLY IT

1. **$636 total, which is $36 more than the cash price.** Use I=Prt: I=600(0.06)(1)=36. Add the interest to the cash price, 600+36=636.
2. **$2,315.25 in the account, with $315.25 interest earned.** Use A=2000(1.05)^3=2315.25. Subtract the original deposit: 2315.25-2000=315.25.

CHALLENGE

Plan A costs less. Plan A costs $1,300, and Plan B costs $1,331, so Plan A costs $31 less. Plan B is higher because compound interest is added to the balance each year, so later interest is charged on earlier interest.

Accept equivalent exact forms for the continuous-interest answer, such as $300e$^{0.2}$. Require money answers to include the correct cents when needed, and accept equivalent reasoning that identifies compound interest as interest earned on prior interest.