Simple Interest: Earning and Paying Interest

Spot mistakes, reason, and work backward

Name _____ **Date** _____ **Score** _____ / 8

QUICK REVIEW

Simple interest uses only original principal: $I = Prt$, with annual rate r as a decimal and time t in years. At 4%, 500 dollars for 6 months has $t = 1/2$, $I = 500(0.04)(1/2) = 10$ dollars and balance 510 dollars.

Worked example

An account has principal \$500.00, annual simple rate 4%, and term $\frac{1}{2}$ years. Find interest and final balance.

1. Annual interest: $500(4/100) = 20$ dollars.
2. $I = Prt = 500(4/100)(\frac{1}{2}) = 10$ dollars.
3. $A = P + I$: $500 + 10 = 510$ dollars.
Answer: Interest \$10.00; balance \$510.00.

Practice Problems

Show your thinking.

1. A savings account earns \$50.00 simple interest in 2 years at 5% annually. Find the original principal and final balance.

2. A loan on \$700.00 at 4% simple interest runs $\frac{1}{2}$ years. Kai compounds the interest each year. Find the correct simple interest and balance.

3. A deposit earns \$40.50 simple interest in $\frac{3}{2}$ years at 3% annually. Find the original principal and final balance.

4. A loan on \$1100.00 at 6% simple interest runs 2 years. Kai compounds the interest each year. Find the correct simple interest and balance.

5. Option A charges 8% simple annual interest on \$600.00 for $\frac{1}{4}$ years. Option B charges \$22.00 total interest. Which is cheaper and by how much?

6. A loan earns \$65.00 simple interest in 1 year at 5% annually. Find the original principal and final balance.

7. A savings account on \$900.00 at 4% simple interest runs 3 months. Kai compounds the interest each year. Find the correct simple interest and balance.

8. A 500 dollar loan costs 15 dollars simple interest over 6 months. Find the annual percent rate, not the six-month rate.

Answer Key

1. Principal $500.00; balance $550.00.
2. Interest $14.00; balance $714.00.
3. Principal $900.00; balance $940.50.
4. Interest $132.00; balance $1232.00.
5. Option A by $10.00.
6. Principal $1300.00; balance $1365.00.
7. Interest $9.00; balance $909.00.
8. 6% per year.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. The interest factor is $rt = (5/100)(2) = \frac{1}{10}$.
2. Recover principal $P = I/(rt)$: $50 \div (\frac{1}{10}) = 500$ dollars.
3. Final balance $A = P + I$: $500 + 50 = 550$ dollars.

Problem 2

1. Annual interest: $700(4/100) = 28$ dollars.
2. $I = Prt = 700(4/100)(\frac{1}{2}) = 14$ dollars.
3. $A = P + I$: $700 + 14 = 714$ dollars.

Problem 3

1. The interest factor is $rt = (3/100)(\frac{3}{2}) = \frac{9}{200}$.
2. Recover principal $P = I/(rt)$: $\frac{81}{2} \div (\frac{9}{200}) = 900$ dollars.
3. Final balance $A = P + I$: $900 + \frac{81}{2} = \frac{1881}{2}$ dollars.

Problem 4

1. Annual interest: $1100(6/100) = 66$ dollars.
2. $I = Prt = 1100(6/100)(2) = 132$ dollars.
3. $A = P + I$: $1100 + 132 = 1232$ dollars.

Problem 5

1. Annual interest: $600(8/100) = 48$ dollars.
2. Option A total simple interest: $I = 600(8/100)(\frac{1}{4}) = 12$ dollars.
3. Option B total interest is $22.00. B minus A: $22 - 12 = 10$ dollars. Since $12 < 22$, option A is cheaper by $10.00.

Problem 6

1. The interest factor is $rt = (5/100)(1) = \frac{1}{20}$.
2. Recover principal $P = I/(rt)$: $65 \div (\frac{1}{20}) = 1300$ dollars.
3. Final balance $A = P + I$: $1300 + 65 = 1365$ dollars.

Problem 7

1. Convert time: $t = 3/12 = \frac{1}{4}$ years.
2. Annual interest: $900(4/100) = 36$ dollars.
3. $I = Prt = 900(4/100)(\frac{1}{4}) = 9$ dollars.
4. $A = P + I$: $900 + 9 = 909$ dollars.

Problem 8

1. Time $t = 6/12 = 1/2$ year.
2. From $15 = 500r(1/2)$, $r = 15/250 = 0.06$.
3. Annual percent number $0.06(100) = 6$, so the annual rate is 6%; check $500(0.06)(1/2) = 15$ dollars.

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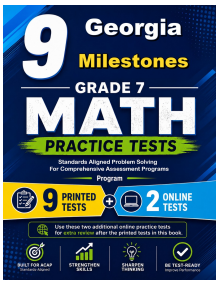

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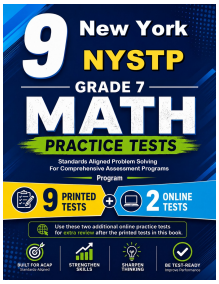

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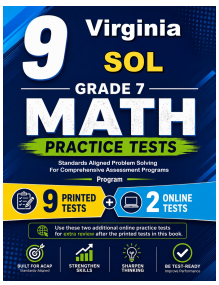

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