Simple Interest: Earning and Paying Interest

Explore ideas and representations

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 has principal \$400.00, annual simple rate 5%, and term 2 years. Find interest and final balance.

2. A loan earns \$12.00 simple interest in $\frac{1}{2}$ years at 4% annually. Find the original principal and final balance.

3. A deposit has principal \$800.00, annual simple rate 3%, and term $\frac{3}{2}$ years. Find interest and final balance.

4. A loan on \$1000.00 at 6% simple interest runs 2 years. Kai compounds the interest each year. Find the correct simple interest and balance.

5. A deposit has principal \$500.00, annual simple rate 8%, and term $\frac{1}{4}$ years. Find interest and final balance.

6. Option A charges 5% simple annual interest on \$1200.00 for 1 year. Option B charges \$70.00 total interest. Which is cheaper and by how much?

7. A class savings account has principal \$800.00, annual simple rate 6%, and term 9 months. Find interest and final balance.

8. An equipment loan earns \$17.50 simple interest in 5 months at 6% annually. Find the original principal and final balance.

Answer Key

1. Interest $40.00; balance $440.00.
2. Principal $600.00; balance $612.00.
3. Interest $36.00; balance $836.00.
4. Interest $120.00; balance $1120.00.
5. Interest $10.00; balance $510.00.
6. Option A by $10.00.
7. Interest $36.00; balance $836.00.
8. Principal $700.00; balance $717.50.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. Annual interest: $400(5/100) = 20$ dollars.
2. $I = Prt = 400(5/100)(2) = 40$ dollars.
3. $A = P + I$: $400 + 40 = 440$ dollars.

Problem 2

1. The interest factor is $rt = (4/100)(\frac{1}{2}) = \frac{1}{50}$.
2. Recover principal $P = I/(rt)$: $12 \div (\frac{1}{50}) = 600$ dollars.
3. Final balance $A = P + I$: $600 + 12 = 612$ dollars.

Problem 3

1. Annual interest: $800(3/100) = 24$ dollars.
2. $I = Prt = 800(3/100)(\frac{3}{2}) = 36$ dollars.
3. $A = P + I$: $800 + 36 = 836$ dollars.

Problem 4

1. Annual interest: $1000(6/100) = 60$ dollars.
2. $I = Prt = 1000(6/100)(2) = 120$ dollars.
3. $A = P + I$: $1000 + 120 = 1120$ dollars.

Problem 5

1. Annual interest: $500(8/100) = 40$ dollars.
2. $I = Prt = 500(8/100)(\frac{1}{4}) = 10$ dollars.
3. $A = P + I$: $500 + 10 = 510$ dollars.

Problem 6

1. Annual interest: $1200(5/100) = 60$ dollars.
2. Option A total simple interest: $I = 1200(5/100)(1) = 60$ dollars.
3. Option B total interest is $70.00. B minus A: $70 - 60 = 10$ dollars. Since $60 < 70$, option A is cheaper by $10.00.

Problem 7

1. Convert time: $t = 9/12 = \frac{3}{4}$ years.
2. Annual interest: $800(6/100) = 48$ dollars.
3. $I = Prt = 800(6/100)(\frac{3}{4}) = 36$ dollars.
4. $A = P + I$: $800 + 36 = 836$ dollars.

Problem 8

1. Convert time: $t = 5/12 = \frac{5}{12}$ years.
2. The interest factor is $rt = (6/100)(\frac{5}{12}) = \frac{1}{40}$.
3. Recover principal $P = I/(rt)$: $\frac{35}{2} \div (\frac{1}{40}) = 700$ dollars.
4. Final balance $A = P + I$: $700 + \frac{35}{2} = \frac{1435}{2}$ dollars.

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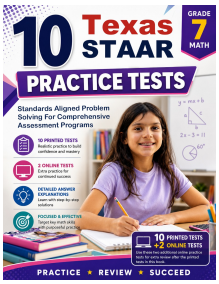

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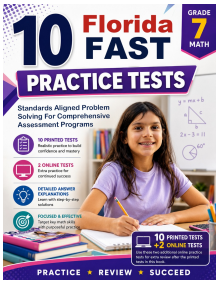

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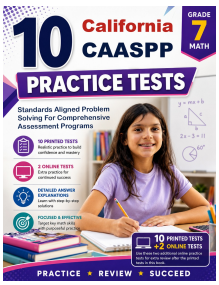

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