6.8 Choosing the Right Formula

Minds On

Identify the Simple Interest and Compound Interest formulas.

\[ I = P \times r \times t \]  \hspace{1cm}  \[ A = P \times (1+i)^n \]

When deciding which formula to use, it is important that you look for key words. If you see the word \textit{Simple interest} in the question, then you use the Simple interest formulas. If you see the word \textit{Compounded} in the question, then you use the Compound interest formulas. There may also be questions that involve both types of formulas.

Example

a) Scott invests $2000 in a 6-year GIC at 6% per year. Interest is compounded quarterly. Calculate the amount of the investment.

\[ A = ? \]
\[ P = 2000 \]
\[ i = 0.06 \div 4 = 0.015 \]
\[ n = 6 \times 4 = 24 \]
\[ A = 2000 \times (1 + 0.015)^{24} \]
\[ = 2859.01 \]

b) How much interest was earned on the investment?

\[ I = A - P \]
\[ = 2859.01 - 2000 \]
\[ = 859.01 \]
Example 2

Kristen invests $5500 in a 4-year GIC that pays simple interest. The interest rate is 5% per year. Calculate the amount of the investment.

\[ I = ? \]
\[ P = 5500 \]
\[ r = 0.05 \]
\[ t = 4 \]

\[ I = P \times r \times t \]
\[ = 5500 \times 0.05 \times 4 \]
\[ = $1100.00 \]

\[ A = P + I \]
\[ = 5500 + 1100 \]
\[ = $6600.00 \]

\[ \text{the amount is } $6600.00 \]

Example 3

Lesley has $5000 to invest for 4 years. She has two investment options:

- A GIC at 4% per year, compounded quarterly.
- A Savings Account with an interest rate of 5% per year that pays simple interest.

Which investment is the better option?

A. \[ A = ? \]
\[ P = 5000 \]
\[ i = 0.04 \div 4 = 0.01 \]
\[ n = 4 \times 4 = 16 \]
\[ A = P \left(1 + i\right)^n \]
\[ = 5000 \left(1 + 0.01\right)^{16} \]
\[ = 5000 \left(1.01\right)^{16} \]
\[ = $5862.89 \]

B. \[ I = ? \]
\[ P = 5000 \]
\[ r = 0.05 \]
\[ t = 4 \]

\[ I = P \times r \times t \]
\[ = 5000 \times 0.05 \times 4 \]
\[ = $1000 \]

\[ A = P + I \]
\[ = 5000 + 1000 \]
\[ = 6000 \]

\[ \text{option B is better!} \]
6.8 Choosing the Right Formula - Worksheet

1. a) Karen invests $2700 in a 4-year GIC at 8% per year. Interest is compounded semi-annually. Calculate the amount of the GIC at the end of 4 years.

b) How much interest did Karen earn?

2. a) Scott invests $5700 in a Canadian Savings Bond at 3.5% per year, compounded semi-annually for 15 years. Calculate the amount of the Canadian Savings Bond at the end of 15 years.

b) How much interest did Scott earn on his investment?

3. Doug invests $10700 in a 8-year GIC that pays simple interest. The interest rate is 4% per year. Calculate the amount of the investment.
4. Craig invests $9500 in a Savings Account that pays simple interest. He invests for 7 years and the interest rate is 5% per year. Calculate the amount of the investment.

5. Miles has $8000 to invest for 10 years. He has two investment options:
   - A GIC at 5% per year, compounded quarterly.
   - A Savings Account with an interest rate of 5.5% per year that pays simple interest.
Which investment is the better option?

6. Shannon has $9500 to invest for 20 years. She has two investment options:
   - A GIC at 8% per year, compounded semi-annually.
   - A Savings Account with an interest rate of 9% per year that pays simple interest.
Which investment is the better option?