

Compound Interest Formula

Calculating compound interest can be calculated by using the compound interest formula:

$$A = P \left(1 + \frac{r}{n}\right)^{nt}$$

where:

- P** is the initial investment amount (principal)
- A** is the final amount
- r** is the annual interest rate expressed as a decimal
- t** is the time in years.
- n** is the number of compounding periods per year.

Common <i>n</i> Values	
Compounding Period	<i>n</i> value
Annually	1
Semi-Annually	2
Quarterly	4
Monthly	12
Bi-Weekly	26
Weekly	52
Daily	365

Example 4

Sarah inherits \$4000 and would like to invest it in a GIC earning 4.5% compound interest for 3 years. She has two options:

- a) Compounded semi-annually.

$$P = 4000$$

$$r = 4.5 \rightarrow 0.045$$

$$t = 3$$

$$n = 2$$

- b) Compounded monthly. ($n=12$)

$$P = 4000$$

$$r = 0.045$$

$$t = 3$$

$$n = 12$$

$$(2 \text{ times/year}) \quad A = P \left(1 + \frac{r}{n}\right)^{nt} \quad (2 \times 3)$$

$$A = 4000 \left(1 + \frac{0.045}{2}\right)^{2 \times 3}$$

$$A = \$4571.30$$

$$A = 4000 \left(1 + \frac{0.045}{12}\right)^{12 \times 3}$$

$$= \$4576.99$$

- c) Which investment is the better option for Sarah? Can you explain why?

Sarah should choose option 'B' because it gives a greater amount of interest (\$5.69).

Complete #1-10 in Assignment 1