

Compound Interest: Future Amount "A"

Compound Interest - Explained

When money is borrowed or invested, the interest is added on to the principal after a previously set period of time. After the same period of time, interest is calculated again. This time it is calculated on the new amount, which includes the principal and interest. This procedure continues for the entire term of the loan or investment.

Compound Interest Formulas

$$A = P(1+i)^n$$

A (or *FV*) is the final amount (or Future Value)

i is the interest rate per compound period

P (or *PV*) is the principal, or initial amount (or Present Value)

n is the TOTAL number of compound periods

To calculate **i**, use $i = \frac{r}{N}$...where

r is the annual interest rate and

N is the number of times interest is paid per year... called the compound period.



Example 1: Determine the values of **P**, **n**, and **i** in the formula $A = P(1+i)^n$ for each.

a) Mary invested \$500 for 5 years at 8%, compounded **semi-annually**.

P =

i =

n =

b) Raymond borrowed \$300 for 3 years at 5%, compounded **quarterly**.

P =

i =

n =

Example 2: Renata invested \$500 at 5% compounded **monthly** for 4 years. What will the investment be worth at the end of the 4-year term?

Solution: $A = P(1 + i)^n$

$A =$

$P =$

$i =$

$n =$

Example 3: An investment broker has told Tony that if he invests \$2500 compounded **bi-weekly** for 3 years, the investment will be worth \$2904.17. Estimate the **annual interest rate**.

Solution: $FV = PV(1 + i)^n$

$FV =$

$PV =$

$i =$

$n =$

Example 4: John has \$5000 to invest into an account in which he will leave the money for 5 years. He is given the choice between three compounding periods below. Which would be his best option?

- i) 3.2%/a compounded annually
- ii) 3.2%/a compounded quarterly
- iii) 3.2%/a compounded monthly

Class work / Homework: pg 468 – 470 #2-6, 9, 11-14