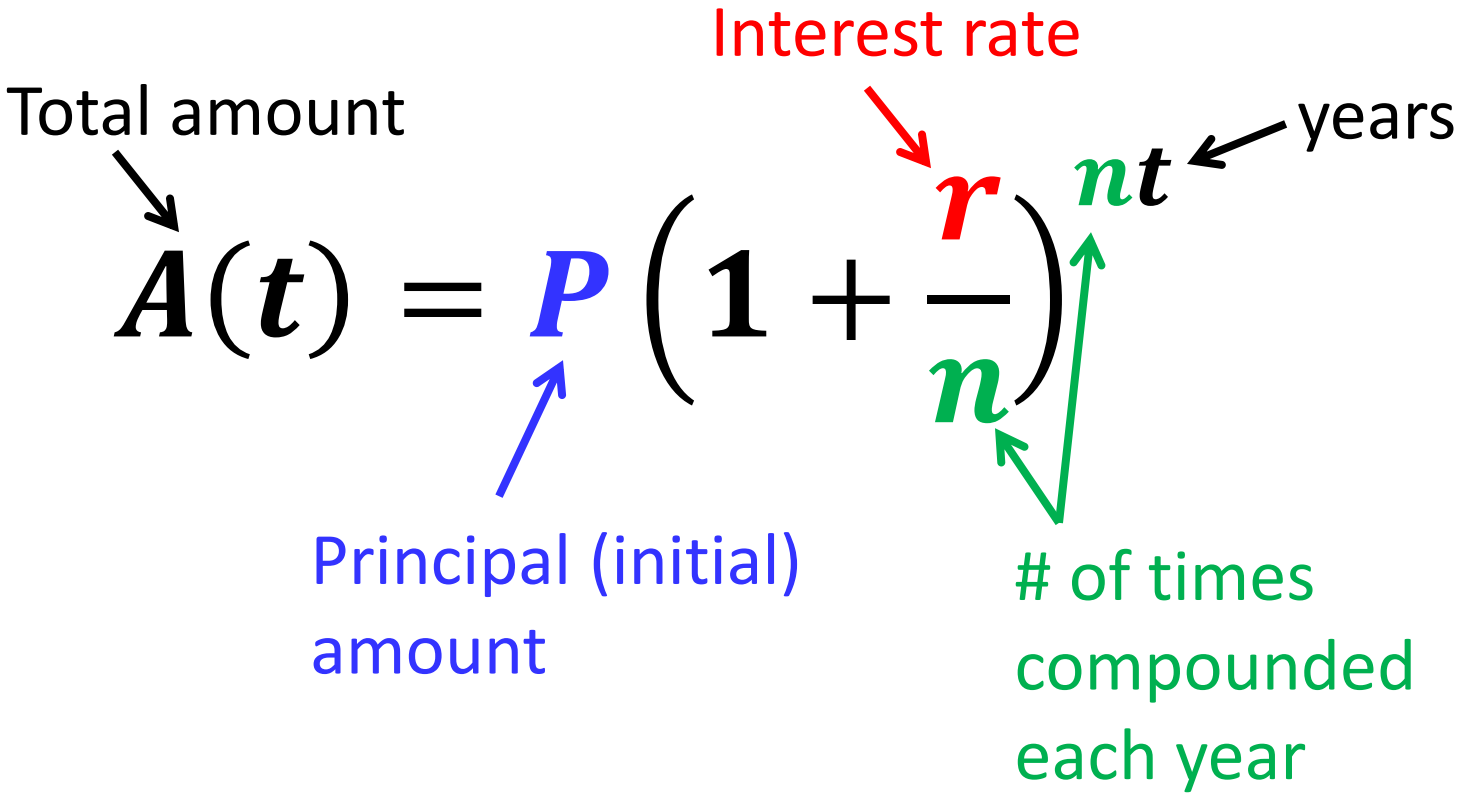
Compound and Continuous Interest

Compound Interest is a common way used to collect interest on money.



Common # of times compounded per year

Name	Times per year
Daily	n = 365
Weekly	n = 52
Monthly	n = 12
Quarterly	n = 4
Semi-Annually	n = 2
Annually / Yearly	n = 1

Simple interest is yearly (n = 1) compound interest.

Sally puts $1,000 into a savings account at her local bank. The saving account has a rate of .45% that is compounded monthly. If Sally leaves the account alone, how much money will be in it after 5 years?

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

$$A(t) = 1000\left(1 + \frac{.0045}{12}\right)^{12t}$$

$$A(5) = 1000\left(1 + \frac{.0045}{12}\right)^{12(5)}$$

$$A(5) = \$1022.75$$

Sally puts $1,000 into a savings account at her local bank. The saving account has a rate of .45% that is compounded daily. If Sally leaves the account alone, how much money will be in it after 5 years?

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

$$A(t) = 1000\left(1 + \frac{.0045}{365}\right)^{365t}$$

$$A(5) = 1000\left(1 + \frac{.0045}{365}\right)^{365(5)}$$

$$A(5) = \$1022.75$$

Sally finds a consistent mutual fund that averages a return yield of 8%. Sally invests $1,000 into the mutual fund and lets it sit for 5 years. Sally's mutual fund compounds quarterly.

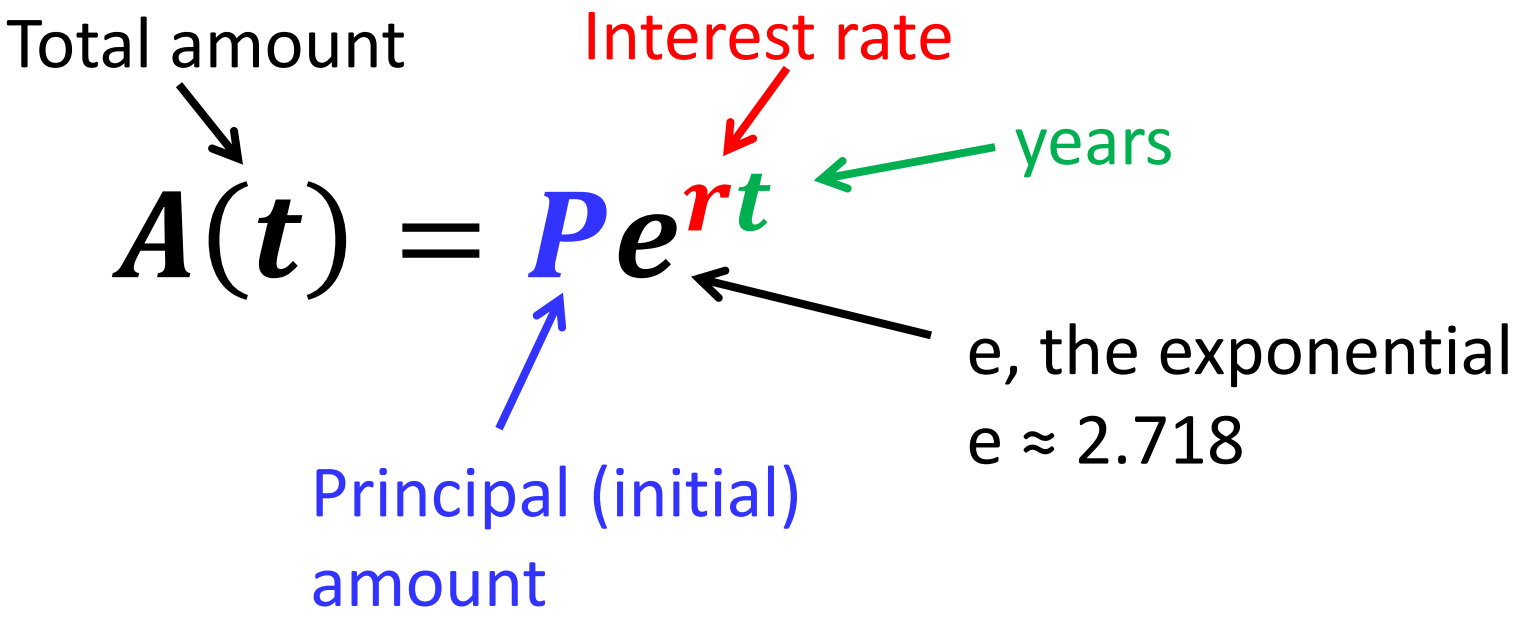
$$A(t) = P\left(1 + \frac{r}{n}\right)^{nt}$$

$$A(t) = 1000\left(1 + \frac{.08}{4}\right)^{4t}$$

$$A(5) = 1000\left(1 + \frac{.08}{4}\right)^{4(5)}$$

$$A(5) = \$1485.95$$

<u>Continuous interest</u> is compound interest compounded every second of every day.



Sally was intrigued by continuous interest. Surely, interest compounded every second of every day would provide for a large return. Sally found a savings account with a .45% rate that compounded continuously. How much money did she have after 5 years?

$$A(t) = Pe^{rt}$$

$$A(t) = 1000e^{0.0045t}$$

$$A(5) = 1000e^{0.0045(5)}$$

$$A(5) = \$1022.76$$