Interest

P: Principal ($) I: Interest ($)

A: final, total Amount ($) (note that $A = P + I$)

t: time (years) r: annual interest rate (as a decimal)

n: the number of times the interest is compounded per year

(Note: e is a constant, approximately 2.71828)

Simple Interest	$I = P * r * t$ $A = P(1 + rt)$
Compounded Interest	$A = P\left(1 + \frac{r}{n}\right)^{nt}$
Continuously Compounded Interest	$A = Pe^{rt}$

Note: the value of n is often determined by the frequency word used.

Yearly (annually):	$n = 1$	Semi-annually:	$n = 2$
Quarterly:	$n = 4$	Bi-weekly:	$n = 26$
Weekly:	$n = 52$	Daily:	$n = 365$

Example: Bobby wants to borrow $100,000 to buy a house. How much will he pay in total for a 20-year loan if the 4% interest is computed as:
a) simple interest; b) compounded monthly; c) compounded continuously?

Based on the wording: P=$100,000 r=0.04 (4% as a decimal) t =20 n =12

a) Simple Interest: $A = P(1 + rt)$
$= \$100{,}000(1 + 0.04 * 20) = \$180{,}000$

b) Compounded Monthly: $A = P\left(1 + \frac{r}{n}\right)^{nt}$
$= \$100{,}000\left(1 + \frac{0.04}{12}\right)^{20*12} = \$222{,}258.21$

c) Compounded Continuously: $A = Pe^{rt}$
$= \$100{,}000 * e^{0.04*20} = \$222{,}554.09$