ANNUITIES & PERPETUITIES

Annuities and perpetuities turn a lump sum of money into a steady flow of cash. What kind of annuity or pepetuity it is will determine when that cash is paid and how long those payments will last.

Annuity

An annuity pays out a set number of periodic payments after you put in a lump sum. All of these payments are the same, and at the end of the payments the account balance is zero.

This makes an annuity a simple TVM problem where the future value is zero.

N = # of payments **I/Y** = discount/interest rate, rate of return, etc.

PV = – lump sum **PMT** = annual cash flows **FV** = Zero

Perpetuity

A perpetuity is an annuity that never ends. A combination of enough money in the beginning and a high enough interest rate ensures that it will continue to pay out forever.

To account for this, set N to a really high number, like 200 or 500.

N = 500 **I/Y** = discount/interest rate, rate of return, etc.

PV = – lump sum **PMT** = annual cash flows **FV** = Zero

Annuity Due

An annuity due is an annuity that makes its first payment at the same time you put in your initial lump sum deposit. (Yeah, I also think that's weird - why not just make the lump sum less?)

Since the payments start today, you have to use Begin Mode.

N = # of payments **I/Y** = discount/interest rate, rate of return, etc.

PV = – lump sum **PMT** = annual cash flows **FV** = Zero

Deferred Annuity

A deferred annuity won't begin to pay out until after a set amount of time. Because of this, *don't* treat it as a Time Value of Money problem. Instead, use Net Present Value cash flows to figure out today's price.

CF0 = Zero **C01** = Zero **F01** = # of years with no payment

C02 = annual cash flow amt **F02** = # of years with payment

I = discount/interest rate, rate of return, etc.

Deferred Perpetuity

Like a deferred annuity, a deferred perpetuity won't begin to pay out until after a set amount of time. Like a regular perpetuity, the payments won't stop once they've started.

Again, solve this as an NPV cash flow problem, not a TVM problem. Just like you did with N in a regular perpetuity, set F02 to be a really high number, like 200 or 500.

CF0 = Zero **C01** = Zero **F01** = # of years with no payment

C02 = annual cash flow amt **F02** = 500

I = discount/interest rate, rate of return, etc.