Annuities and perpetuities turn a lump sum of money into a steady flow of cash. What kind of annuity or perpetuity 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.