Math 177 Week 2 Notes

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- Annuity: a series of payments to be made at defined times in the future
  - Annuity-certain: payments are not contingent on a future event
  - We assume annuity-certain unless specified otherwise
- Annuity-immediate: a series of payments for which the following conditions are met
  1. the interest rate is constant at i per payment period (*frequency*)
  2. the payments are of equal amount (*term of the annuity*: nthe number of payments)
  3. the payments are made at the end of each payment period
  4. either one of:
     - the AV is valued at the time of (and including) the final payment:

$$s_{\overline{n}|i} := \sum_{t=0}^{n-1}(1+i)^t = \frac{(1+i)^n - 1}{i}$$

     - the PV is valued one period before the first payment:

$$a_{\overline{n}|i} := \sum_{t=1}^{n} v^t = \frac{1-v^n}{i}$$

  - Note: $s_{\overline{n}|i} = (1+i)^n a_{\overline{n}|i}$ and $a_{\overline{n}|i} = v^n s_{\overline{n}|i}$
- Annuity-due: same as annuity-immedaite in the first three conditions, with modified condition 4:
  4. either one of:
     - the AV is valued one period after the final payment
     - the PV is valued at the time of the first payment