

## Dr. Minor Time Value of Money: Overview

Purpose	Calculator Key	Excel Function
Solve for Number of Periods	N	<b>NPer</b> (rate, pmt, pv, fv, type)
Solve for periodic interest rate	I/Yr	<b>Rate</b> (nper, pmt, pv, fv, type, guess)
Solve for present value	PV	<b>PV</b> (rate, nper, pmt, fv, type)
Solve for annuity payment	PMT	<b>PMT</b> (rate, nper, pv, fv, type)
Solve for future value	FV	<b>FV</b> (rate, nper, pmt, pv, type)

### Solving TVM Problems

1. Read problem thoroughly
2. Create a time line
3. Put cash flows and arrows on time line
4. Determine if it is a PV, FV, or Annuity (PMT) problem
5. Determine if solution involves a single CF, annuity stream(s), or mixed flow
6. Solve the problem

#### Is it a PV, FV, or Annuity (PMT) problem?

- ❖ Suppose that you have \$100 to invest for a period of 5 years at an interest rate of 10% per year. How much will you have accumulated at the end of this time period? **\$161.05**
- ❖ Suppose that you are planning to send your daughter to college in 18 years. Furthermore, assume that you have determined that you will need \$100,000 at that time in order to pay for tuition, room and board, party supplies, etc. If you believe that you can earn an average annual rate of return of 8% per year, how much money would you need to invest today as a lump sum to achieve your goal? **\$25,024.90**
- ❖ Suppose that you will be borrowing \$1000 each year for 10 years at a rate of 9%, and then paying back the loan immediate after receiving the last payment. How much would you have to repay? **\$15,192.93**
- ❖ Suppose that you have \$1,250 today and you would like to know how long it will take you double your money to \$2,500. Assume that you can earn 9% per year on your investment. **8.04**
- ❖ What is the present value of Janet's IRA if she deposits \$1000 annually with an annual return of 5 percent 12 years from now? **\$8,863.25**
- ❖ Suppose that you are planning to send your daughter to college in 18 years. Furthermore, assume that you have determined that you will need \$100,000 at that time in order to pay for tuition, room and board, party supplies, etc. If you have \$20,000 to invest today, what compound average annual rate of return do you need to earn in order to reach your goal? **9.35%**