

## M118 SECTION 3.4 – Present Value of an Annuity

1) Present Value Annuities – when you make periodic withdrawals (PMT) from a fund (PV)

In general

$$PV = \frac{PMT \left(1 - \left(1 + \frac{r}{n}\right)^{-nt}\right)}{\frac{r}{n}}$$

How much should you deposit now in an account paying 6% compounded semiannually in order to withdraw \$1000 every 6 months for the next 3 years?

$$PV = \frac{1000(1 - (1.03)^{-6})}{.03} = 5417.19$$

TVM SOLVER

$$N = 6$$

$$I = 6$$

$$PV = ? \quad PV = 5417.19$$

$$PMT = -1000$$

$$FV = 0$$

$$P/Y = 2$$

$$C/Y = 2$$

In order to "kill off" a loan you amortize it.

You need to know balance at any given time, so construct an amortization table

HANDOUT

#32 A recreational vehicle costs \$80,000. You pay 10% down and amortize the rest with equal monthly payments over a 7-year period. If you must pay 9.25% compounded monthly, what is your monthly payment? How much interest will you pay?

$$N =$$

$$I =$$

$$PV =$$

$$PMT =$$

$$FV =$$

$$P/Y =$$

$$C/Y =$$

#34 Construct the amortization schedule for a \$10,000 debt that is to be amortized in eight equal quarterly payments at 2.8% interest per quarter on the unpaid balance.

N=  
I =  
PV=  
PMT =  
FV =  
P/Y =  
C/Y =

**TVM SOLVER** has three variables PV, PMT, and FV. At any given time only two will be in play and the third one will be 0.

**COMPOUND INTEREST:** You put a lump sum of money in the bank and just leave it

$$\mathbf{PV = - \quad PMT = 0 \quad FV = +}$$

**FUTURE VALUE ANNUITY:** You make periodic payments into an account to accumulate a sum of money

$$\mathbf{PV = 0 \quad PMT = - \quad FV = +}$$

**PRESENT VALUE ANNUITY:** There is a lump sum in an account and you make periodic withdrawals or you pay off a lump sum that you have borrowed..

$$\mathbf{PV = + \quad PMT = - \quad FV = 0}$$

