Math 111 **Finance Worksheet A**

APPS Finance TVM Solver
While cursor is blinking on the value to be calculated, enter ALPHA ENTER (SOLVE).

TVM Solver	
N=	**N** = number of payment periods
I%=	**I%** = annual interest rate (do not convert to a decimal; if APR = 9%, the I% = 9)
PV=	**PV** = present value (amount of the loan) or beginning lump sum investment
PMT=	**PMT** = per period payment amount
FV=	**FV** = future value
P/Y=	**P/Y** = number of payments per year
C/Y=	**C/Y** = number of compounding periods per year
PMT: END BEGIN	**PMT: END BEGIN** (When the regular payments are made: at the BEGINing of the period or at the END)

1. **Lump Sum Investment**: When Bud Uronner was born, his grandfather made an initial deposit of $3,000 into an account for his college education. Assuming an interest rate of 6% compounded quarterly, how much will the account be worth in 18 years?

N= I%= PV= PMT= **FV=** P/Y= C/Y= PMT: END BEGIN	$A = P\left(1 + \frac{r}{n}\right)^{nt}$ $A = 3000\left(1 + \frac{.06}{4}\right)^{4(18)}$	**Explorations**: (a) Compare the effect of increasing **n** on the future value. Let **n** take on all the usual values: 1, 2, 4, 12, 52, 365. Complete the table below. Does a larger value of **n** increase the future value dramatically? Explain. (b) Compare the effect of increasing **r** on the future value. Let **r** take on all the values: 1%, 5%, 8%, 9%, 13%, 20%. Complete the table below. Does a larger value of **r** increase the future value dramatically? Explain.

n	A (r = .06; P = 3000; t = 18)
1	
2	
4	
12	
52	
365	

r	A (n = 4; P = 3000; t = 18)
.01	
.05	
.08	
.09	
.13	
.20	

2. **Rule of 72**: Orson Buggy wants his $5,000 investment to double in 6 years. What annual interest rate must he earn? Assume interest is compounded annually.

N= **I%=** PV= PMT= FV= P/Y= C/Y= PMT: END BEGIN	$A = P\left(1 + \frac{r}{n}\right)^{nt}$ $10000 = 5000\left(1 + \frac{r}{1}\right)^{1(6)}$	**Explorations**: • Compare the effect of changing **t** on the interest rate, **r**. Multiply **t** and **r** in each case. Let n = 1; A = 10000; P = 5000. Use the following values for **N** = **t**: 2, 3, 4, 6, 8, 9, 12, 18, 24, 36. Complete the table below. How is this exploration related to the rule of 72?

t	r	r * t
2		
3		
4		
6		
8		
9		
12		
18		
24		
36		

3. **Effective Annual Yield:** Find the effective rate corresponding to a nominal rate of 8.5% compounded quarterly.

►Eff(r%, n) =	$Y = \left(1 + \frac{r}{n}\right)^{n} - 1$ $Y = \left(1 + \frac{.085}{4}\right)^{4} - 1$

4. **Effective Annual Yield:** Find the nominal rate corresponding to an effective rate of 7.13%. Assume that the interest of the nominal rate is compounded daily.

►Nom(r%, n) =	$Y = \left(1 + \frac{r}{n}\right)^{n} - 1$ $.0713 = \left(1 + \frac{r}{365}\right)^{365} - 1$