7.1 Compound Interest Notes

Compound Interest Formula

$$A(t) = P\left(1 + \frac{r}{n}\right)^{nt}$$

annually n = 1
semi-annually n = 2
monthly n = 12
quarterly n = 4
weekly n = 52
daily n = 365

P – principal ($ you invest)
r – annual interest rate (expressed as a decimal)
n – # of time interest is compounded
t – time in years

Ex. 1 Find the final amount of a $100 investment after 10 years at 5% interest compounded annually, quarterly, and daily.

P t r

annually (n=1)
$A(10) = 100\left(1 + \frac{.05}{1}\right)^{(1)(10)}$
$= \$162.89$

quarterly (n=4)
$A(10) = 100\left(1 + \frac{.05}{4}\right)^{(4)(10)}$
$= \$164.36$

daily (n=365)
$A(10) = 100\left(1 + \frac{.05}{365}\right)^{365(10)}$
$= \$164.87$

Ex. 2 Which will yield more money? Investing $2000 for 4 years, compounded semi-annually at 3.7% or investing $1600 for 6 years, compounded weekly at 3.8% ?

$A(4) = 2000\left(1 + \frac{.037}{2}\right)^{2(4)}$
$= \$2315.89$

$A(6) = 1600\left(1 + \frac{.038}{52}\right)^{52(6)}$
$= \$2009.57$

So yields more money.

Ex. 3 **Maria bought a computer for $1297 five years ago. Unfortunately, it was stolen and her insurance company claims that the value depreciates 14% each year. How much money was her insurance company willing to give her for her stolen computer?** "decay"

multiplier $1 - .14 = .86$

$$V = 1297(1 - .14)^5$$

$$= \$610.14$$