MATH 114
ASSORTED FORMULAS

$$Simple\ Interest = P * r * t$$

$$Principal + 200\%\ increase = triple$$

absolute change = new value – reference value

$$\text{rel diff} = \frac{\text{compare value} - \text{reference value}}{\text{reference value}} \times 100\%$$

COMPOUND INTEREST FORMULAS

$$\frac{log(1 + total\ return)}{log(1 + annual\ return)} = Years$$

	A	B
1	How much to save now	=PV(
2	How much will I have in the future	=FV(
3	How much to save/pay monthly	=PMT(
4	How many years/months will it take?	=NPER(

A = accumulated balance after *Y* years (FV)
P = starting principal or lump sum (PV)
APR = annual percentage rate (as a decimal)
n = number of compounding periods per year
Y = number of years
e = a special irrational number with a value
APY = annual percentage yield
nper = number of periods/months/years (n*Y)

$$A = \text{PMT} \times \frac{\left[\left(1 + \frac{\text{APR}}{n}\right)^{(nY)} - 1\right]}{\left(\frac{\text{APR}}{n}\right)}$$

$$\text{PMT} = \frac{A + \frac{\text{APR}}{n}}{\left[\left(1 + \frac{\text{APR}}{n}\right)^{(nY)} - 1\right]}$$

$$A = P \times (1 + \text{APR})^{Y}$$

$$\text{total return} = \frac{(A - P)}{P} \times 100\%$$

$$A = P\left(1 + \frac{\text{APR}}{n}\right)^{(nY)}$$

$$\text{annual return} = \left(\frac{A}{P}\right)^{(1/Y)} - 1$$

$$A = P \times e^{(\text{APR} \times Y)}$$