Math 3 **Exponential Functions Notes** Name:_____

Exponential Functions: functions of the form $y = b^x$ where b is a positive real number & the exponent is a variable

Example:

$f(x) = 3^x$

Exponential Growth Equation:	**Compound Interest Equation:**
$N = N_0(1+r)^t$	$A = P(1+\frac{r}{n})^{nt}$
N= final amount	A = final amount of the investment
N_0= initial amount	P = Principle (initial investment)
r = rate of growth	r = annual interest rate
t = time	n = # of times interest is compounded each year
	t = # of years

Biology **Suppose a researcher estimates that the initial population of a colony of cells is 100. If the cells reproduce at a rate of 25% per week, what is the expected population of the colony in six weeks?**

$N = N_0(1+r)^t$

$N_0 = 100$

$r = 0.25$

$t = 6$

$N = 100(1+.25)^6$

$N \approx 381.4697$

There will be about 381 cells in the colony in 6 weeks.

Finance **Determine the amount of money in a money market account that provides an annual rate of 6.3% compounded quarterly if $1700 is invested and left in the account for eight years**

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

$P = 1700$

$r = .063$

$n = 4$ - quarterly

$t = 8$

$A = 1700(1+\frac{.063}{4})^{4(8)}$

$A \approx 2803.028$

After 8 yrs, the $1700 investment will have a value of $283.03.