Compounded Interest

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

(Compounded Continuously)

A = Final amount

P = Principal amount (starting amount)

r = rate (percentage as a decimal) 07.4% → 0.074

n = number of times compounds per year.

t = number of years (time)

n =	Compounding Periods
1	annually
2	semiannually
4	quarterly
12	monthly
52	weekly
365	daily
use other equation	Continuously

V

Bob is depositing $400 in a savings account with 7% interest, compounded monthly. How much will be in the savings account in 10 years?

$A = A$, $P = 400$, $r = 0.07$, $n = 12$, $t = 10$

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

$A = 400(1+\frac{0.07}{12})^{120}$

$A = \$803.86$

Janet started a bank account 12 years ago which paid 6% interest, compounded quarterly. and then forgot about it. She just remembered she had the account and checked the balance. She now has $10,217.39. How much was her initial deposit? (4.12)

$A = 10,217.39$, $P = P$, $r = 0.06$, $n = 4$, $t = 12$

$10,217.39 = P(1+\frac{0.06}{4})^{48}$

$10,217.39 = P(2.04)$

$4999.999 = P$

$\$5000.00 = P$

How long will it take for Robert to earn $1200 on $500 that earns 9% interest, compounded daily?

$A = 1200$, $P = 500$, $n = 0.09$, $n = 365$, $t = t$

$\frac{1200}{500} = \frac{500(1+\frac{0.09}{365})^{365t}}{500}$ isolate base

$(1.00025)^{365t} = 2.4$

$\log_{1.00025} 2.4 = 365t$

$\frac{\log 2.4}{\log 1.00025} = 365t \rightarrow 3550.95 = 365t$

$9.73 = t$

Michael decides to invest his graduation money ($2000) in a money market account which pays 7.2%, compounded continuously. $A = Pe^{rt}$

How much will he have in 5 years?

$A = A$, $P = 2000$, $r = 0.072$, $t = 5$

$A = 2000e^{(0.072)(5)}$

$A = 2866.66$

When will the money double in value?

$A = 4000$, $P = 2000$, $r = 0.072$, $t = t$

$\frac{4000}{2000} = \frac{2000e^{(0.072t)}}{2000}$

$2 = e^{(0.072t)}$

$\ln 2 = 0.072t$

$0.693 = 0.072t$

$9.63_{\text{years}} = t$

The following is the classwork and homework

Algebra II Support **Name:**

$A = P\left(1+\frac{r}{n}\right)^{nt}$, where P is the principal, r is the rate of interest, n is the type of compounding and t is the length of the investment.

$A = Pe^{rt}$, where P is the principal, r is the rate of interest, and t is the length of the investment.

1. Ron invested $55,000 in a nine-year CD that pays out twelve percent compounded monthly. What is the amount after fifteen years?

2. Rick has a savings bond that will be worth $8,220 in eight years. The interest rate of the bond is 5% that is compounded semiannually. Find the present value of the bond.

3. $650 is invested at 5.2% in an account that is compounded continuously. How long would it take for the account to reach a balance of $1000?

4. The number of tissue cells in a culture at the beginning of the experiment was 4300. If the cells split at a rate of r = .12, how many days will it take the culture to double? (Use $P = P_0e^{rt}$, where P_0 = # of cells at start, P = # of cells at end, r = rate, t = time in days.)

5. James has a savings bond that will be worth $10,000 in seven years. The bond has an interest rate of 20% that is compounded semi-annually. Find the present value of the bond.

6. If $2500 is invested in an account that is compounded continuously for 5 years, the account grows to $3200. What would the interest rate be on this account?