COMPOUND INTEREST FORMULAS

Compounded a finite number of times

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

$A =$ Amount

$P =$ Principal

$r =$ interest rate

$n =$ # of times compounded

$t =$ time in years

Compounded Continuously

$$A = Pe^{r \cdot t}$$

$A =$ Amount

$P =$ Principal

$r =$ interest rate

$t =$ time in years

Compound Interest Sample Problems

1. If you invest $2500 in an account that pays 12% interest, compounded quarterly, how much would you have at the end of 17 years?

$A =$

$P =$

$r =$

$n =$

$t =$

$$A = P\left(1+\frac{r}{n}\right)^{n\cdot t} \quad \text{or} \quad A = Pe^{r\cdot t}$$

2. How much would you have to invest in an account that pays 6% interest, compounded monthly, to have a balance of $30,000 at the end of 10 years?

$A =$

$P =$

$r =$

$n =$

$t =$

$$A = P\left(1+\frac{r}{n}\right)^{n\cdot t} \quad \text{or} \quad A = Pe^{r\cdot t}$$

3. How long will it take for an investment of $2,000 in an account that pays $8\frac{1}{2}\%$ interest compounded quarterly to become $15,000.

$A =$

$P =$

$r =$

$n =$

$t =$

$$A = P\left(1+\frac{r}{n}\right)^{n\cdot t} \quad \text{or} \quad A = Pe^{r\cdot t}$$

4. How long will it take for an amount of money to double if deposited in an account that pays 4.5% interest compounded monthly?

$A =$

$P =$

$r =$

$n =$

$t =$

$$A = P\left(1+\frac{r}{n}\right)^{n\cdot t} \quad \text{or} \quad A = Pe^{r\cdot t}$$

5. At what interest rate must you invest $10,000 to have an ending balance of $72,000 at the end of 14 years? (Assume interest is compounded quarterly.)

$A =$

$P =$

$r =$

$n =$

$t =$

$$A = P\left(1+\frac{r}{n}\right)^{n\cdot t} \quad \text{or} \quad A = Pe^{r\cdot t}$$

6. If you invest $12,000 in an account that pays 4% interest compounded continuously, how much will you have at the end of 20 years.

$A =$

$P =$

$r =$

$n =$

$t =$

$$A = P\left(1+\frac{r}{n}\right)^{n\cdot t} \quad \text{or} \quad A = Pe^{r\cdot t}$$

7. At what interest rate must you invest \$5,000 to have an ending balance of \$8,000 in 5 years. (Assume interest is compounded continuously.)

$A =$

$P =$

$r =$

$n =$

$t =$

$$A = P\left(1 + \frac{r}{n}\right)^{n \cdot t} \quad \text{or} \quad A = Pe^{r \cdot t}$$