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# Important Formulas of Compound Interest

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# List of 15 Important Formulas of Compound Interest

## Important Formulas of Compound Interest

### Compound Interest

#### 1) Compound Interest Formula

$$\text{fx } CI = P \cdot \left( \left( 1 + \frac{r}{n \cdot 100} \right)^{n \cdot t} - 1 \right)$$

[Open Calculator !\[\]\(de95854c7ee024cfadc48187bbb781b2\_img.jpg\)](#)

$$\text{ex } 160.7545 = 1000 \cdot \left( \left( 1 + \frac{5}{4 \cdot 100} \right)^{4 \cdot 3 \text{Year}} - 1 \right)$$

#### 2) Final Amount of Compound Interest

$$\text{fx } A = P \cdot \left( 1 + \frac{r}{n \cdot 100} \right)^{n \cdot t}$$

[Open Calculator !\[\]\(6a9b39b98eb945faa14c645ec99e4eaa\_img.jpg\)](#)

$$\text{ex } 1160.755 = 1000 \cdot \left( 1 + \frac{5}{4 \cdot 100} \right)^{4 \cdot 3 \text{Year}}$$



### 3) Principal Amount of Compound Interest

$$fx \quad P = \frac{CI}{\left(1 + \frac{r}{n \cdot 100}\right)^{n \cdot t} - 1}$$

[Open Calculator !\[\]\(cbe80b694ebd74fcfe136a095b608235\_img.jpg\)](#)

$$ex \quad 1001.527 = \frac{161}{\left(1 + \frac{5}{4 \cdot 100}\right)^{4 \cdot 3 \text{Year}} - 1}$$

### 4) Rate of Compound Interest

$$fx \quad r = n \cdot 100 \cdot \left( \left( \frac{CI}{P} + 1 \right)^{\frac{1}{n \cdot t}} - 1 \right)$$

[Open Calculator !\[\]\(3e2231b1ad3ca8da8658228c00dd08e0\_img.jpg\)](#)

$$ex \quad 5.007137 = 4 \cdot 100 \cdot \left( \left( \frac{161}{1000} + 1 \right)^{\frac{1}{4 \cdot 3 \text{Year}}} - 1 \right)$$

### 5) Time Period of Compound Interest

$$fx \quad t = \frac{1}{n} \cdot \log \left( \left( 1 + \frac{r}{n \cdot 100} \right), \frac{CI}{P} + 1 \right)$$

[Open Calculator !\[\]\(0d5ec72f61334709c3fc9450209b754f\_img.jpg\)](#)

$$ex \quad 3.004256 \text{Year} = \frac{1}{4} \cdot \log \left( \left( 1 + \frac{5}{4 \cdot 100} \right), \frac{161}{1000} + 1 \right)$$



## Annual Compound Interest

### 6) Annual Compound Interest

fx

Open Calculator 

$$CI_{\text{Annual}} = P_{\text{Annual}} \cdot \left( \left( 1 + \frac{r_{\text{Annual}}}{100} \right)^{t_{\text{Annual}}} - 1 \right)$$

ex

$$44 = 100 \cdot \left( \left( 1 + \frac{20}{100} \right)^{2\text{Year}} - 1 \right)$$

### 7) Annual Rate of Compound Interest

fx

Open Calculator 

$$r_{\text{Annual}} = 100 \cdot \left( \left( \frac{CI_{\text{Annual}}}{P_{\text{Annual}}} + 1 \right)^{\frac{1}{t_{\text{Annual}}}} - 1 \right)$$

ex

$$20 = 100 \cdot \left( \left( \frac{44}{100} + 1 \right)^{\frac{1}{2\text{Year}}} - 1 \right)$$

### 8) Final Amount of Annual Compound Interest

fx

Open Calculator 

$$A_{\text{Annual}} = P_{\text{Annual}} \cdot \left( 1 + \frac{r_{\text{Annual}}}{100} \right)^{t_{\text{Annual}}}$$

ex

$$144 = 100 \cdot \left( 1 + \frac{20}{100} \right)^{2\text{Year}}$$



## 9) Principal Amount of Annual Compound Interest

$$fx \quad P_{\text{Annual}} = \frac{CI_{\text{Annual}}}{\left(1 + \frac{r_{\text{Annual}}}{100}\right)^{t_{\text{Annual}}} - 1}$$

[Open Calculator !\[\]\(e2376d476d06eb31946dc01a69a4403a\_img.jpg\)](#)

$$ex \quad 100 = \frac{44}{\left(1 + \frac{20}{100}\right)^{2\text{Year}} - 1}$$

## 10) Time Period of Annual Compound Interest

$$fx \quad t_{\text{Annual}} = \log\left(\left(1 + \frac{r_{\text{Annual}}}{100}\right), \frac{CI_{\text{Annual}}}{P_{\text{Annual}}} + 1\right)$$

[Open Calculator !\[\]\(0b5e7e25e8775f7e7e80906ada4f0021\_img.jpg\)](#)

$$ex \quad 2\text{Year} = \log\left(\left(1 + \frac{20}{100}\right), \frac{44}{100} + 1\right)$$

## Semi Annual Compound Interest

### 11) Final Amount of Semi Annual Compound Interest

$$fx \quad A_{\text{Semi Annual}} = P_{\text{Semi Annual}} \cdot \left(1 + \frac{r_{\text{Annual}}}{2 \cdot 100}\right)^{2 \cdot t_{\text{Semi Annual}}}$$

[Open Calculator !\[\]\(0fb13ad0bfa3d86868cdd3883e5665b3\_img.jpg\)](#)

$$ex \quad 13310 = 10000 \cdot \left(1 + \frac{20}{2 \cdot 100}\right)^{2 \cdot 1.5\text{Year}}$$



## 12) Principal Amount of Semi Annual Compound Interest

$$\text{fx } P_{\text{Semi Annual}} = \frac{CI_{\text{Semi Annual}}}{\left(1 + \frac{r_{\text{Annual}}}{2 \cdot 100}\right)^{2 \cdot t_{\text{Semi Annual}}} - 1}$$

[Open Calculator !\[\]\(d3fb9f94af8b26d1c844efa9a98805b0\_img.jpg\)](#)

$$\text{ex } 10000 = \frac{3310}{\left(1 + \frac{20}{2 \cdot 100}\right)^{2 \cdot 1.5 \text{Year}} - 1}$$

## 13) Semi Annual Compound Interest

$$\text{fx } CI_{\text{Semi Annual}} = P_{\text{Semi Annual}} \cdot \left( \left(1 + \frac{r_{\text{Annual}}}{2 \cdot 100}\right)^{2 \cdot t_{\text{Semi Annual}}} - 1 \right)$$

[Open Calculator !\[\]\(e1d6102fe77919492c04879c8450f1f5\_img.jpg\)](#)

$$\text{ex } 3310 = 10000 \cdot \left( \left(1 + \frac{20}{2 \cdot 100}\right)^{2 \cdot 1.5 \text{Year}} - 1 \right)$$

## 14) Semi Annual Rate of Compound Interest given Annual Rate

$$\text{fx } r_{\text{Semi Annual}} = \frac{r_{\text{Annual}}}{2}$$

[Open Calculator !\[\]\(ab4e2b3fc7e7887b7a72f548aa6f5e60\_img.jpg\)](#)

$$\text{ex } 10 = \frac{20}{2}$$



## 15) Time Period of Semi Annual Compound Interest

**fx****Open Calculator **

$$t_{\text{Semi Annual}} = \frac{1}{2} \cdot \log \left( \left( 1 + \frac{r_{\text{Annual}}}{2 \cdot 100} \right), \frac{CI_{\text{Semi Annual}}}{P_{\text{Semi Annual}}} + 1 \right)$$

**ex** 
$$1.5 \text{Year} = \frac{1}{2} \cdot \log \left( \left( 1 + \frac{20}{2 \cdot 100} \right), \frac{3310}{10000} + 1 \right)$$




## Variables Used

- **A** Final Amount of CI
- **A<sub>Annual</sub>** Final Amount of Annual CI
- **A<sub>Semi Annual</sub>** Final Amount of Semi Annual CI
- **CI** Compound Interest
- **CI<sub>Annual</sub>** Annual Compound Interest
- **CI<sub>Semi Annual</sub>** Semi Annual Compound Interest
- **n** No. of Times Interest Compounded Per Year
- **P** Principal Amount of Compound Interest
- **P<sub>Annual</sub>** Principal Amount of Annual Compound Interest
- **P<sub>Semi Annual</sub>** Principal Amount of Semi Annual CI
- **r** Rate of Compound Interest
- **r<sub>Annual</sub>** Annual Rate of Compound Interest
- **r<sub>Semi Annual</sub>** Semi Annual Rate of Compound Interest
- **t** Time Period of Compound Interest (*Year*)
- **t<sub>Annual</sub>** Time Period of Annual Compound Interest (*Year*)
- **t<sub>Semi Annual</sub>** Time Period of Semi Annual CI (*Year*)





## Constants, Functions, Measurements used

- **Function:** **log**,  $\log(\text{Base}, \text{Number})$   
*Logarithm function*
- **Measurement:** **Time** in Year (Year)  
*Time Unit Conversion* 



## Check other formula lists

- [Compound Interest Formulas](#) 
- [Simple Interest Formulas](#) 

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