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Percentage of Numbers Formulas

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List of 21 Percentage of Numbers Formulas

Percentage of Numbers

1) Convert Decimal to Percentage

$$\text{fx } \% = D \cdot 100$$

[Open Calculator !\[\]\(a870788d6ed9b8fd294b7654a8c8526b_img.jpg\)](#)

$$\text{ex } 70 = 0.7 \cdot 100$$

2) Convert Percentage to Decimal

$$\text{fx } D = \frac{\%}{100}$$

[Open Calculator !\[\]\(c50c8b7b2cc2cf9ff925edec0ee94c0d_img.jpg\)](#)

$$\text{ex } 0.7 = \frac{70}{100}$$

3) Number Z is What Percentage of Number Y

$$\text{fx } X = \frac{Z \cdot 100}{Y}$$

[Open Calculator !\[\]\(f60b7a900783ac3fd531bfd9c111be6d_img.jpg\)](#)

$$\text{ex } 10 = \frac{2 \cdot 100}{20}$$

4) Number Z is X Percentage of What

$$\text{fx } Y = \frac{Z \cdot 100}{X}$$

[Open Calculator !\[\]\(83bbbd261710c59db0214aa27b2edc0d_img.jpg\)](#)

$$\text{ex } 20 = \frac{2 \cdot 100}{10}$$



5) Percentage Difference between Two Numbers

$$\text{fx } \%_{(X-Y)} = \left(\frac{\text{modulus}(X - Y)}{\frac{X+Y}{2}} \right) \cdot 100$$

Open Calculator 

$$\text{ex } 66.66667 = \left(\frac{\text{modulus}(10 - 20)}{\frac{10+20}{2}} \right) \cdot 100$$

6) Time Duration is What Percentage of Day

$$\text{fx } \%_{\text{Day}} = \frac{\text{hr} + \text{min} + \text{s}}{86400} \cdot 100$$

Open Calculator 

$$\text{ex } 15.68287 = \frac{3\text{h} + 45\text{min} + 50\text{s}}{86400} \cdot 100$$

7) X Percentage of Number Y

$$\text{fx } Z = \frac{X \cdot Y}{100}$$

Open Calculator 

$$\text{ex } 2 = \frac{10 \cdot 20}{100}$$

Percentage Change 8) New Number given Percentage Decrease

$$\text{fx } X_{\text{New}} = X_{\text{Original}} \cdot \left(1 - \frac{\%_{\text{Decrease}}}{100} \right)$$

Open Calculator 

$$\text{ex } 88 = 100 \cdot \left(1 - \frac{12}{100} \right)$$



9) New Number given Percentage Increase

$$\text{fx } X_{\text{New}} = X_{\text{Original}} \cdot \left(\frac{\% \text{Increase}}{100} + 1 \right)$$

Open Calculator 

$$\text{ex } 112 = 100 \cdot \left(\frac{12}{100} + 1 \right)$$

10) Original Number given Percentage Decrease

$$\text{fx } X_{\text{Original}} = \frac{X_{\text{New}}}{1 - \frac{\% \text{Decrease}}{100}}$$

Open Calculator 

$$\text{ex } 127.2727 = \frac{112}{1 - \frac{12}{100}}$$

11) Original Number given Percentage Increase

$$\text{fx } X_{\text{Original}} = \frac{X_{\text{New}}}{\frac{\% \text{Increase}}{100} + 1}$$

Open Calculator 

$$\text{ex } 100 = \frac{112}{\frac{12}{100} + 1}$$

12) Percentage Change (Increase or Decrease) in Number

$$\text{fx } \% \text{Change} = \left(\frac{X_{\text{New}} - X_{\text{Original}}}{X_{\text{Original}}} \right) \cdot 100$$

Open Calculator 

$$\text{ex } 12 = \left(\frac{112 - 100}{100} \right) \cdot 100$$



Percentage Change in Circle

13) Percentage Change in Area of Circle given Percentage Change in Radius

$$\text{fx } A_{(\text{Circle})\% \text{Change}} = \left(\left(1 + \frac{R_{\% \text{Change}}}{100} \right)^2 - 1 \right) \cdot 100$$

[Open Calculator !\[\]\(74d4806277d7e73349d8e8c0897931e9_img.jpg\)](#)

$$\text{ex } 69 = \left(\left(1 + \frac{30}{100} \right)^2 - 1 \right) \cdot 100$$

14) Percentage Change in Radius of Circle given Percentage Change in Area

$$\text{fx } R_{\% \text{Change}} = \left(\sqrt{1 + \frac{A_{(\text{Circle})\% \text{Change}}}{100}} - 1 \right) \cdot 100$$

[Open Calculator !\[\]\(8bba887393ca45b761e5cb49e755e762_img.jpg\)](#)

$$\text{ex } 30 = \left(\sqrt{1 + \frac{69}{100}} - 1 \right) \cdot 100$$

Percentage Change in Rectangle

15) Percentage Change in Area of Rectangle given Percentage Change in Length and Breadth

$$\text{fx } A_{(\text{Rect})\% \text{Change}} = \left(\left(\left(1 + \frac{L_{\% \text{Change}}}{100} \right) \cdot \left(1 + \frac{B_{\% \text{Change}}}{100} \right) \right) - 1 \right) \cdot 100$$

[Open Calculator !\[\]\(799877f5c2f906134441300079881630_img.jpg\)](#)

$$\text{ex } 300 = \left(\left(\left(1 + \frac{60}{100} \right) \cdot \left(1 + \frac{150}{100} \right) \right) - 1 \right) \cdot 100$$



16) Percentage Change in Breadth of Rectangle given Percentage Change in Length



$$\text{fx } B_{\% \text{Change}} = \left(\frac{1}{1 + \frac{L_{\% \text{Change}}}{100}} - 1 \right) \cdot 100$$

Open Calculator

$$\text{ex } -37.5 = \left(\frac{1}{1 + \frac{60}{100}} - 1 \right) \cdot 100$$

17) Percentage Change in Breadth of Rectangle given Percentage Change in Length and Area



$$\text{fx } B_{\% \text{Change}} = \left(\frac{1 + \frac{A_{(\text{Rect})\% \text{Change}}}{100}}{1 + \frac{L_{\% \text{Change}}}{100}} - 1 \right) \cdot 100$$

Open Calculator

$$\text{ex } 150 = \left(\frac{1 + \frac{300}{100}}{1 + \frac{60}{100}} - 1 \right) \cdot 100$$

18) Percentage Change in Length of Rectangle given Percentage Change in Area and Breadth



$$\text{fx } L_{\% \text{Change}} = \left(\frac{1 + \frac{A_{(\text{Rect})\% \text{Change}}}{100}}{1 + \frac{B_{\% \text{Change}}}{100}} - 1 \right) \cdot 100$$

Open Calculator

$$\text{ex } 60 = \left(\frac{1 + \frac{300}{100}}{1 + \frac{150}{100}} - 1 \right) \cdot 100$$



19) Percentage Change in Length of Rectangle given Percentage Change in Breadth



$$\text{fx } L_{\% \text{Change}} = \left(\frac{1}{1 + \frac{B_{\% \text{Change}}}{100}} - 1 \right) \cdot 100$$

Open Calculator

$$\text{ex } -60 = \left(\frac{1}{1 + \frac{150}{100}} - 1 \right) \cdot 100$$

Percentage Change in Square

20) Percentage Change in Area of Square given Percentage Change in Side

$$\text{fx } A_{(\text{Square})\% \text{Change}} = \left(\left(1 + \frac{S_{\% \text{Change}}}{100} \right)^2 - 1 \right) \cdot 100$$

Open Calculator

$$\text{ex } 96 = \left(\left(1 + \frac{40}{100} \right)^2 - 1 \right) \cdot 100$$

21) Percentage Change in Side of Square given Percentage Change in Area

$$\text{fx } S_{\% \text{Change}} = \left(\sqrt{\frac{A_{(\text{Square})\% \text{Change}}}{100} + 1} - 1 \right) \cdot 100$$

Open Calculator

$$\text{ex } 40 = \left(\sqrt{\frac{96}{100} + 1} - 1 \right) \cdot 100$$



Variables Used

- **%** Percentage
- **%(X-Y)** Percentage Difference
- **%Change** Percentage Change in Number
- **%Day** Percentage of Day
- **%Decrease** Percentage Decrease in Number
- **%Increase** Percentage Increase in Number
- **A(Circle)%Change** Percentage Change in Area of Circle
- **A(Rect)%Change** Percentage Change in Area of Rectangle
- **A(Square)%Change** Percentage Change in Area of Square
- **B%Change** Percentage Change in Breadth of Rectangle
- **D** Decimal
- **hr** Number of Hours (*Hour*)
- **L%Change** Percentage Change in Length of Rectangle
- **min** Number of Minutes (*Minute*)
- **R%Change** Percentage Change in Radius of Circle
- **s** Number of Seconds (*Second*)
- **S%Change** Percentage Change in Side of Square
- **X** Number X
- **X_{New}** New Value of Number
- **X_{Original}** Original Value of Number
- **Y** Number Y
- **Z** Number Z



Constants, Functions, Measurements used

- **Function:** **modulus**, modulus
Modulus of number
- **Function:** **sqrt**, sqrt(Number)
Square root function
- **Measurement:** **Time** in Hour (h), Minute (min), Second (s)
Time Unit Conversion 



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