

Important Percentage of Numbers Formulas PDF



Formulas Examples with Units

List of 21 Important Percentage of Numbers Formulas

1) Convert Decimal to Percentage Formula ↻

Formula

$$\% = D \cdot 100$$

Example

$$70 = 0.7 \cdot 100$$

Evaluate Formula ↻

2) Convert Percentage to Decimal Formula ↻

Formula

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

Example

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

Evaluate Formula ↻

3) Number Z is What Percentage of Number Y Formula ↻

Formula

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

Example

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

Evaluate Formula ↻

4) Number Z is X Percentage of What Formula ↻

Formula

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

Example

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

Evaluate Formula ↻

5) Percentage Difference between Two Numbers Formula ↻

Formula

$$\%_{(X-Y)} = \left(\frac{\text{mod } \textcolor{red}{us} (X - Y)}{\frac{X + Y}{2}} \right) \cdot 100$$

Example

$$66.6667 = \left(\frac{\text{mod } \textcolor{red}{us} (10 - 20)}{\frac{10 + 20}{2}} \right) \cdot 100$$

Evaluate Formula ↻

6) Time Duration is What Percentage of Day Formula ↻

Formula

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

Example with Units

$$15.6829 = \frac{3\text{h} + 45\text{min} + 50\text{s}}{86400} \cdot 100$$

Evaluate Formula ↻



7) X Percentage of Number Y Formula

Formula

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

Example

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

Evaluate Formula 

8) Percentage Change Formulas

8.1) New Number given Percentage Decrease Formula

Formula

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

Example

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

Evaluate Formula 

8.2) New Number given Percentage Increase Formula

Formula

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

Example

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

Evaluate Formula 

8.3) Original Number given Percentage Decrease Formula

Formula

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

Example

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

Evaluate Formula 

8.4) Original Number given Percentage Increase Formula

Formula

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

Example

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

Evaluate Formula 

8.5) Percentage Change (Increase or Decrease) in Number Formula

Formula

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

Example

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

Evaluate Formula 



8.6) Percentage Change in Circle Formulas ↻

8.6.1) Percentage Change in Area of Circle given Percentage Change in Radius Formula ↻

Formula

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

Example

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

Evaluate Formula ↻

8.6.2) Percentage Change in Radius of Circle given Percentage Change in Area Formula ↻

Formula

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

Example

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

Evaluate Formula ↻

8.7) Percentage Change in Rectangle Formulas ↻

8.7.1) Percentage Change in Area of Rectangle given Percentage Change in Length and Breadth Formula ↻

Formula

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

Evaluate Formula ↻

Example

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

8.7.2) Percentage Change in Breadth of Rectangle given Percentage Change in Length Formula ↻

Formula

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

Example

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

Evaluate Formula ↻

8.7.3) Percentage Change in Breadth of Rectangle given Percentage Change in Length and Area Formula ↻

Formula

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

Example

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

Evaluate Formula ↻



8.7.4) Percentage Change in Length of Rectangle given Percentage Change in Area and Breadth Formula

Formula

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

Example

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

Evaluate Formula 

8.7.5) Percentage Change in Length of Rectangle given Percentage Change in Breadth Formula

Formula

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

Example

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

Evaluate Formula 

8.8) Percentage Change in Square Formulas

8.8.1) Percentage Change in Area of Square given Percentage Change in Side Formula

Formula

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

Example

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

Evaluate Formula 

8.8.2) Percentage Change in Side of Square given Percentage Change in Area Formula

Formula

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

Example

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

Evaluate Formula 



Variables used in list of Percentage of Numbers Formulas above

- **%** 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 in list of Percentage of Numbers Formulas above

- **Functions: modulus**, modulus
Modulus of a number is the remainder when that number is divided by another number.
- **Functions: sqrt**, sqrt(Number)
A square root function is a function that takes a non-negative number as an input and returns the square root of the given input number.
- **Measurement: Time** in Hour (h), Minute (min), Second (s)
Time Unit Conversion 



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