

# Writing Equations in $\text{\LaTeX}$

**Spoken Tutorial**

<http://spoken-tutorial.org>

**National Mission on Education through ICT**

<http://www.sakshat.ac.in>

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# Learning Objectives

## 1. How to write *an* equation in $\text{\LaTeX}$



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1. **How to write *an* equation in  $\text{\LaTeX}$**
2. **How to write *multiple* equations**



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1. How to write *an* equation in  $\text{\LaTeX}$
2. How to write *multiple* equations
3. How to *align* multiple equations



# Learning Objectives

1. How to write *an* equation in  $\text{\LaTeX}$
2. How to write *multiple* equations
3. How to *align* multiple equations
4. Why avoid \$ mode and blank lines



# System Requirements

- ▶ Works on Ubuntu, Windows and Mac
- ▶ TeXworks, and  $\text{\LaTeX}$
- ▶ Can use without TeXworks also
- ▶ Other Linux systems are also ok



# Prerequisites

- ▶ Spoken tutorials that introduce  $\text{\LaTeX}$



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- ▶ Exposure to the side-by-side method





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- ▶ All available from  
<https://spoken-tutorial.org>



# Additional Learning Material

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# A Standard Reference

**$\text{\LaTeX}$  - A Document Preparation System  
User's Guide and Reference Manual  
Pearson Education, New Delhi  
Second Edition, 1994  
Price: About ₹500**



# What did we learn?

- ▶ Create equations using `align`
- ▶ Why avoid `$` and blank lines
- ▶ Align equations using `&`
- ▶ Insert text between eqn. with `intertext`
- ▶ If there is no text in between equations, use `\\`



# What did we learn?

- ▶ Create equations using `align`
- ▶ Why avoid `$` and blank lines
- ▶ Align equations using `&`
- ▶ Insert text between eqn. with `intertext`
- ▶ If there is no text in between equations, use `\\`

**Assignment 1: Recall all of the above**





# More Assignments



## 2. Create these equations

$$a = b + c$$

$$abcd = f + g + h$$



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$$a = b + c$$

$$abcd = f + g + h$$

**These equations are created by**

```
\begin{align*}
```

```
a = b + c \\\
```

```
abcd = f + g + h
```

```
\end{align*}
```



### 3. Align them

**Align the equations as given here:**

$$a = b + c$$

$$abcd = f + g + h$$



## 4. What if you forget &

**Suppose you forget & in second equation:**

```
\begin{align*}
a &= b + c \\
abcd &= f + g + h
\end{align*}
```



## 4. What if you forget &

**Suppose you forget & in second equation:**

```
\begin{align*}
a &= b + c \\
abcd &= f + g + h
\end{align*}
```

**You get this output:**

$$\begin{array}{rcl} & a & = b + c \\ abcd & = f + g + h \end{array}$$



## 5. Align differently

How do you produce the following?

$$a = b + c$$

$$abcd = f + g + h$$

Hint: `&` should be put in a different place!



## 6. Align three equations

$$\alpha = \beta + \gamma \quad (1)$$

$$\alpha + \beta = \frac{\gamma}{\delta} + \delta \int \mu d\mu \quad (2)$$

$$\alpha + \beta\mu = \gamma\delta \quad (3)$$





## 6. Align three equations

$$\alpha = \beta + \gamma \quad (1)$$

$$\alpha + \beta = \frac{\gamma}{\delta} + \delta \int \mu d\mu \quad (2)$$

$$\alpha + \beta\mu = \gamma\delta \quad (3)$$

```
\begin{align}
\alpha &= \beta + \gamma \\
\alpha + \beta &= \frac{\gamma}{\delta} + \delta \int \mu d\mu \\
\alpha + \beta\mu &= \gamma\delta
\end{align}
```



# 7. Put text in between equations

**Insert some text between equations:**

$$\alpha = \beta + \gamma \tag{1}$$

$$\alpha + \beta = \frac{\gamma}{\delta} + \delta \int \mu d\mu \tag{2}$$

$$\alpha + \beta\mu = \gamma\delta \tag{3}$$



# About the Spoken Tutorial Project



# About the Spoken Tutorial Project

- ▶ **Watch the video available at**  
[https://spoken-tutorial.org/What\\_is\\_a\\_Spoken\\_Tutorial](https://spoken-tutorial.org/What_is_a_Spoken_Tutorial)
- ▶ **It summarises the Spoken Tutorial project**
- ▶ **If you do not have good bandwidth, you can download and watch it**



# Spoken Tutorial Workshops

## The Spoken Tutorial Project Team

- ▶ Conducts workshops using spoken tutorials
- ▶ Gives certificates to those who pass an online test

For more details, please write to  
**[contact@spoken-tutorial.org](mailto:contact@spoken-tutorial.org)**



# Answers for THIS Spoken Tutorial

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You will have to register to ask questions



# Where to post $\text{\LaTeX}$ questions?

- ▶ For topics not covered in spoken tutorials, visit <http://tex.stackexchange.com/>
- ▶ This is a great place to get answers



# Contact us for general questions

- ▶ You may have questions on workshops, certificates, etc.
- ▶ For this, get in touch with us at **[contact@spoken-tutorial.org](mailto:contact@spoken-tutorial.org)**



# Acknowledgements

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- ▶ **National Mission on Education through ICT (NMEICT)**
- ▶ **Pandit Madan Mohan Malaviya  
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# Thanks!

