

# How various formats can deal with L<sup>A</sup>T<sub>E</sub>X math

HPL

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This document is translated to the format **pdf<sub>l</sub>atex**. The purpose is to test math and doonce and various output formats.

**Test 1: Inline math.** Here is a sentence contains the equation  $u(t) = e^{-at}$ .

**Test 2: A single equation without label.** Here it is

$$u(t) = e^{-at}$$

**Test 3: A single equation with label.** Here it is as a one-line latex code,

```
!bt
\begin{equation} u(t)=e^{-at} \label{eq1}\end{equation}
!et
```

looking like

$$u(t) = e^{-at} \tag{1}$$

and as a three-line latex code:

```
!bt
\begin{equation}
u(t)=e^{-at} \label{eq1b}
\end{equation}
!et
```

looking like

$$u(t) = e^{-at} \tag{2}$$

This equation has label (??).

**Test 4: Multiple, aligned equations without label.** Only the align environment is supported by other formats than L<sup>A</sup>T<sub>E</sub>X for typesetting multiple, aligned equations. The code reads

```
!bt
\begin{align*}
u(t)&=e^{-at}\\
v(t)-1 &= \frac{du}{dt}
\end{align*}
!et
```

and results in

$$\begin{aligned} u(t) &= e^{-at} \\ v(t) - 1 &= \frac{du}{dt} \end{aligned}$$

**Test 5: Multiple, aligned equations with label.** We use align with labels:

```
!bt
\begin{align}
u(t)&=e^{-at} \\
\label{eq2b} & \\
v(t)-1 &= \frac{du}{dt} \\
\label{eq3b} & \\
\end{align}
!et
```

and results in

$$u(t) = e^{-at} \tag{3}$$

$$v(t) - 1 = \frac{du}{dt} \tag{4}$$

We can refer to the last equations as the system (??)-(??).

**Test 6: Multiple, aligned eqnarray equations without label.** Let us try the old eqnarray environment.

```
!bt
\begin{eqnarray*}
u(t)&=&e^{-at}\\
v(t)-1 &=&\frac{du}{dt}
\end{eqnarray*}
!et
```

and results in

$$\begin{aligned} u(t) &= e^{-at} \\ v(t) - 1 &= \frac{du}{dt} \end{aligned}$$

**Test 7: Multiple, eqnarrayed equations with label.** We use eqnarray with labels:

```
!bt
\begin{eqnarray}
u(t)&=&e^{-at} \\
\label{eq2c}\backslash
v(t)-1&=&\frac{du}{dt} \\
\label{eq3c}
\end{eqnarray}
!et
```

and results in

$$u(t) = e^{-at} \tag{5}$$

$$v(t) - 1 = \frac{du}{dt} \tag{6}$$

Can we refer to the last equations as the system (??)-(??)?

**Test 8: newcommands and boldface bm vs pmb.** We have

$$\frac{\partial \mathbf{u}}{\partial t} + \nabla \cdot \nabla \mathbf{u} = \nu \nabla^2 \mathbf{u} - \frac{1}{\varrho} \nabla p,$$

and  $\nabla \mathbf{u}(\mathbf{x}) \cdot \mathbf{n}$  with plain old pmb. Here are the same formulas using \bm:

$$\frac{\partial \mathbf{u}}{\partial t} + \nabla \cdot \nabla \mathbf{u} = \nu \nabla^2 \mathbf{u} - \frac{1}{\varrho} \nabla p,$$

and  $\nabla \mathbf{u}(\mathbf{x}) \cdot \mathbf{n}$ .