How various formats can deal with LaTeX math

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This document is translated to the format **pdflatex**. The purpose is to test math and doconce 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 LaTeX 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

$$\begin{aligned}
u(t)&=e^{-at} && (3)\\
v(t) - 1 &= \frac{du}{dt} && (4)
\end{aligned}$$

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

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

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

```
!bt
\begin{eqnarray}
u(t)&=& e^{-at}
label{eq2c}\\
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

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

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

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

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