Latex Example, Multiple Lines Equations

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1 Multiple Lines of Equation

1.1 Split, Center around Symbol

```
\begin{align}\label{eq:split}
  \begin{split}
    x_1 &= 1 \\
    y &= 1        \\
    h(x) &= f(-20 + 10 + 20) \\
    g(x) &= f(12) \approx 2
  \end{split}
\end{align}
```

$$\begin{aligned} x_1 &= 1 \\ y &= 1 \\ h(x) &= f(-20 + 10 + 20) \\ g(x) &= f(12) \approx 2 \end{aligned} \tag{1}$$

*https://fanwangecon.github.io, repository: Tex4Econ

1.2 Gathered, Center of Page

```
\begin{align}\label{eq:gathered}
  \begin{gathered}
    x_1 = 1, x_2 = 1         \\
    h(x) = f(-20 + 15 + 17) \\
    h(x) = f(12) \approx 1
  \end{gathered}
\end{align}
```

$$\begin{gathered} x_1 = 1, x_2 = 1 \\ h(x) = f(-20 + 15 + 17) \\ h(x) = f(12) \approx 1 \end{gathered} \tag{2}$$

2 Substack vs Array

```
\begin{align}
    \begin{split}
    \label{eq:Value}
    v_{ih}\left(a,z\right)
        =
        \max_{
            \substack{
                c>0\\
                a' \in \{0,[\bar{A}_{ih},\infty)\}
                }
            }
        u\left(c\right)+  \beta \int v_{ih}\left(a',z'\right)f(z'|z)dz'\\
    \label{eq:Value}
    v_{ih}\left(a,z\right)
        =
        \max_{
            \begin{array}{cc}
                c>0\\
                a' \in \{0,[\bar{A}_{ih},\infty)\}\\
            \end{array}
            }
        u\left(c\right)+  \beta \int v_{ih}\left(a',z'\right)f(z'|z)dz'\\
    \end{split}
\end{align}
```

Using Substack, fonts are small under max:

$$v_{ih}\left(a,z\right)=\max_{\substack{c>0\\ a'\in\{0,[\bar{A}_{ih},\infty)\}}} u\left(c\right)+\beta\int v_{ih}\left(a',z'\right)f(z'|z)dz' \tag{3}$$

Using Array, fonts are larger under max:

$$v_{ih}\left(a,z\right)=\max_{\begin{array}{c} c>0\\ a'\in\{0,[\bar{A}_{ih},\infty)\}\end{array}} u\left(c\right)+\beta\int v_{ih}\left(a',z'\right)f(z'|z)dz' \tag{4}$$

3 Multiple Lines

```
\begin{align}
    x = y + z +
    \left\{
      \begin{array}{l}
            a \\
            + b \\
            + c \\
            + d \\
      \end{array}
    \right\}
\end{align}
```

$$x = y + z + \left\{ \begin{array}{l} a \\ +b \\ +c \\ +d \end{array} \right\} \tag{5}$$