WPG

Practical LaTeX # 23

Cases Environment

Outline

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- Cases Environment
- Aligned Formulas
  - Simple Alignment
  - Annotated Alignment
  - Cases
- Cases Alignment Example

Cases Environment

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- **Cases Environment** is used to **write formulas that has multiple cases.**
- Cases Environment must **appear within a math environment** such as the **equation environment** or the **align environment.**
- Separate the **equation** and **the condition** with the **& symbol**.

$$|x| = \begin{cases} x, & \text{x} \geq 0 \\ -x, & \text{x} < 0 \end{cases}$$

```
$$
\vert x \vert = \begin{cases}
        x,          & \text{x $\ge 0$}\\
        -x,         & \text{x $< 0$}
    \end{cases}
$$
```

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$$f(x) = \begin{cases} 0, & \text{x} \le -1 \\ \sqrt{1-x^2}, & -1 < \text{x} < 1 \\ x, & \text{x} \ge 1 \end{cases}$$

```
$$
f(x) = \begin{cases}
        0,                  & \text{x $\le -1$}\\
        \sqrt{1-x^2},       & \text{$-1 < $ x $< 1$}\\
        x,                  & \text{x $\ge 1$}
    \end{cases}
$$
```

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- **Multiple Cases Formulas** can be aligned in the **align environment**.

$$|x| = \begin{cases} x, & \text{x} \geq 0 \\ -x, & \text{x} < 0 \end{cases}$$

$$f(x) = \begin{cases} 0, & \text{x} \leq -1 \\ \sqrt{1-x^2}, & -1 < \text{x} < 1 \\ x, & \text{x} \geq 1 \end{cases}$$

```
\begin{align*}
    \vert x \vert &= \begin{cases}
        x,          & \text{x $\ge 0$}\\
        -x,         & \text{x $< 0$}
        \end{cases}\\
    f(x) &= \begin{cases}
            0,              & \text{x $\le -1$}\\
            \sqrt{1-x^2},   & \text{$-1 < $ x $< 1$}\\
            x,              & \text{x $\ge 1$}
        \end{cases}
\end{align*}
```

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$$\lim_{x\to 2-} f(x) = 6, \text{where} f(x) = \begin{cases} x, & x > 2 \\ 3x, & x \leq 2 \end{cases}$$

```
$$
    \lim_{x\to 2-} f(x) = 6, \text{where} f(x) = \begin{cases}
                                                    x,          & \text{$x>2$}\\
                                                    3x,         & \text{$x \le 2$}
                                                 \end{cases}
$$
```

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$$V_{ijk} = \begin{cases} \dfrac{y_u + y_t}{2} - \dfrac{x_u + x_t}{2}, & \text{if } x_u < y_t \\ \dfrac{1}{C}\left[\dfrac{x_u^3 - y_t^3}{6} + \dfrac{y_t^2 + x_u^2}{2} x_l + (x_u - y_t)\dfrac{x_l^2}{2}\right. & \\ \quad \left. + \dfrac{y_u^2 - x_u^2}{2}(x_u - x_l) - (y_u - x_u)\dfrac{x_u^2 - x_t^2}{2}\right], & \text{if } x_u \in [y_t, y_u] \\ \dfrac{1}{x_u - x_l}\left[\dfrac{(y_u + y_t)^2}{6} - \dfrac{y_u + y_t}{2} x_l + \dfrac{x_l^2}{2}\right], & \text{otherwise} \end{cases}$$

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```
\begin{align*}
    V_{ijk} = \begin{cases}
        \dfrac{y_u + y_t}{2} - \dfrac{x_u + x_t}{2},        & \text{if $x_u < y_t$} \\[4ex]
        \begin{multlined}
            \dfrac{1}{C} \biggl[ \dfrac{x_u^3 - y_t^3}{6} + \dfrac{y_t^2 + x_u^2}{2}x_l +
            \left(x_u - y_t\right) \dfrac{x_l^2}{2}\\
             + \dfrac{y_u^2 - x_u^2}{2} \left( x_u - x_l \right) - \left( y_u - x_u \right)
             \dfrac{x_u^2 - x_t^2}{2}   \biggr]
        \end{multlined},                                    & \text{if $x_u \in [y_t, y_u]$}
        \\[8ex]
        \dfrac{1}{x_u - x_l}\left[ \dfrac{(y_u + y_t)^2}{6} - \dfrac{y_u + y_t}{2} x_l +
        \dfrac{x_l^2}{2} \right],                           & \text{otherwise}
    \end{cases}
\end{align*}
```

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Hope that You Like the Tutorial!

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