Latex Math Examples

1 (re)defined letters/symbols

```
$$
\A, \B, \F, \G, \L, \M, \N, \R, \Z, \epsilon, \eps
$$
```

$$\mathcal{A}, \mathcal{B}, \mathcal{F}, \mathcal{G}, \text{Ł}, \mathcal{M}, \mathbb{N}, \mathbb{R}, \mathbb{Z}, \varepsilon, \varepsilon$$

2 scale hat symbol

```
$$
\hat{\text{word}}, \scalehat{1}{\text{word}}, \scalehat{2}{\text{word}},
\scalehat{3}{\text{word}}
$$
```

$$\hat{\text{word}}, \hat{\text{word}}, \widehat{\text{word}}, \widehat{\text{word}}$$

3 probability and expectation operators

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$$
\PR{X = x}, \E{X}, \Var{X}, \Cov{X,Y}, \Corr{X,Y}, \hatVar{\hat\theta}
$$
```

$$\mathbf{P}(X = x), \mathbb{E}[X], \mathrm{Var}(X), \mathrm{Cov}(X, Y), \mathrm{Corr}(X, Y), \widehat{\mathrm{Var}}\left(\hat{\theta}\right)$$

3.1 conditionals

```
$$
\PR{X \leq x \suchthat Y = y}, \E{X \suchthat Y}
$$
```

$$\mathbf{P}(X \leq x \mid Y = y), \mathbb{E}[X \mid Y]$$

4 talking about random variables

```
$$
\begin{aligned}
X \indep Y \\
X \eqdist Y \\
Y \distas{N}{\mu,\sigma^2} \\
Y_i \iidas{N}{\mu,\sigma^2} \\
Y_i \indepas{N}{\mu_i,\sigma^2} \\
\bar Y \approxas{N}{\mu,\frac{\sigma^2}{n}} \\
\bar Y \pto \mu \\
\bar Y \asto \mu \\
\bar Y \dto Z \\
\bar Y \Lpto{2} \mu
\end{aligned}
$$
```

$$
\begin{aligned}
X \perp\!\!\!\perp Y \\
X \overset{\mathrm{d}}{=} Y \\
Y \sim \mathrm{N}\left(\mu, \sigma^2\right) \\
Y_i \overset{\text{iid}}{\sim} \mathrm{N}\left(\mu, \sigma^2\right) \\
Y_i \overset{\text{ind.}}{\sim} \mathrm{N}\left(\mu_i, \sigma^2\right) \\
\bar{Y} \dot{\sim} \mathrm{N}\left(\mu, \frac{\sigma^2}{n}\right) \\
\bar{Y} \xrightarrow{\mathrm{p}} \mu \\
\bar{Y} \xrightarrow{\text{a.s.}} \mu \\
\bar{Y} \xrightarrow{\mathrm{d}} Z \\
\bar{Y} \xrightarrow{\mathrm{L}^2} \mu
\end{aligned}
$$

5 misc math things

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$$
A \notimply B, \floor{x}, \ceil{y}
$$
```

$$
A \notRightarrow B, \lfloor x \rfloor, \lceil y \rceil
$$