$$
\begin{aligned}
BY_t &= Y_{t-1} \\
B^2Y_t &= Y_{t-2} \\
&\cdots \\
B^kY_t &= Y_{t-k}
\end{aligned}
$$

$$\nabla Y_t = Y_t - Y_{t-1}$$

$$
\begin{aligned}
\nabla^2 Y_t &= \nabla(\nabla Y_t) \\
&= \nabla(Y_t - Y_{t-1}) \\
&= Y_{t-1} - Y_{t-2}
\end{aligned}
$$

$$B^kY_t = B_kY_t$$

$$
\begin{aligned}
B_s^kY_t &= B^{ks}Y_t \\
&= Y_{t-ks}
\end{aligned}
$$

$$B_{12}^kY_t = Y_{t-k\cdot 12}$$

$$(1-B)Y_t = Y_t - Y_{t-1}$$

$$
\begin{aligned}
(1-B)^2Y_t &= (1-2B+B^2)Y_t \\
&= Y_t - 2Y_{t-1} + Y_{t-2}
\end{aligned}
$$

$$\nabla_s^kY_t = (1-B_s)^kY_t$$

AR(p)

$$e_t = Y_t - \sum_{k=1}^{p} a_kY_{t-k}$$

$$e_t = (1 - \sum_{k=1}^{p} a_kB^k)Y_t$$

$$e_t = \phi(B)Y_t$$

MA(q)

$$Y_t = e_t - \sum_{k=1}^{p} b_ke_{t-k}$$

$$Y_t = (1 - \sum_{k=1}^{p} b_kB^k)e_t$$

$$Y_t = \theta(B)e_t$$

ARMA(p,q)

$$Y_t = \theta(B)e_t$$

$$e_t = \phi(B)Y_t$$

$$\phi(B)Y_t = \theta(B)e_t$$

$$a(B)Y_t = b(B)e_t$$

ARIMA(p,d,q)

$$\nabla^d Y_t = W_t$$

$$W_t : ARMA(p,q)$$

$$\nabla_s^d Y_t = (1 - B_s)^d Y_t$$

SARIMA(p,d,q)(P,D,Q)