W5 Formulae

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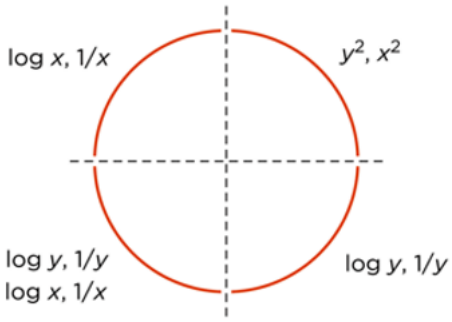
Transformations



We apply log-log transformation in Constant Elasticity Model to convert it into SLR equation.

[Math Processing Error]

Take log

$$\log(D) = \log(C) - \epsilon \log(p)$$

Compare with

$$y = \beta_0 + \beta_1 x$$

then

$y = log(D) \rightarrow$ Response variable
$x = log(p) \rightarrow$ Explanatory variable

$\beta_0 = log(C) \rightarrow y$-intercept or market-size
$\beta_1 = -\epsilon \rightarrow$ Slope

and

$\therefore C = e^{\beta_0} = D(1) \rightarrow$ Demand when price = 1.
$\epsilon = -\beta_1 \rightarrow$ Elasticity value.

Revenue maximizing price	Profit maximizing price
$p^* = -\frac{D(0)}{2m}$	$p^* = \frac{D(0) + mc}{2m}$

[Primal-Dual]

Mean Squared Error,

$$MSE = \frac{1}{n} \sum_{i=1}^{n} (y_i - \hat{y}_i)^2$$

Root Mean Squared Error,

$$RMSE = \sqrt{MSE}$$