(1)
$$\textbf{For } x_i, i \in \{1, 2, ...n\}$$
$$\bar{x}_A = \frac{1}{n}\sum_{i=1}^{n} x_i$$

(2)
$$\textbf{For } x_i, i \in \{1, 2, ...n\}$$
$$\bar{x}_G = \left(\prod_{i=1}^{n} x_i\right)^{\frac{1}{n}}$$

(3)
$$\textbf{For } x_i, i \in \{1, 2, ...n\}$$
$$\bar{x}_H = n\frac{1}{\sum_{i=1}^{n} \frac{1}{x_i}}$$

(4)
$$\max_{\vec{w}_k} \sum_{i=1}^{n} (\vec{x}_i \vec{w}_k)^2$$

(5)
$$\pi_1 - \pi_0 = \sum_i p_{i1}s_{i1} - \sum_i p_{i0}s_{i0}$$

(6)
$$\pi_1 - \pi_0 = \sum_i \Delta p_{i1}s_{i0} + \sum_i p_{i0}\Delta s_{i1} + \sum_i \Delta p_{i1}\Delta s_{i1}$$

(7)
$$y_i = \beta_0 + \beta_1 D_{1i} + \beta_2 D_{2i} + \beta_3 D_{1i} D_{2i} + \epsilon_i$$

(8)
$$D_{1i} \in \{0, 1\}, D_{2i} \in \{0, 1\}$$

(9)
$$E[\epsilon | D_{1i} D_{2i}] = 0 \text{ (Exogeneity and zero-mean)}$$
$$E[\epsilon^2] = \sigma^2 \text{ (Homoskedasticity)}$$

(10)
$$\bar{y}_1 = \beta_0 \text{(when } D_{1i} = 0, D_{2i} = 0\text{)}$$
$$\bar{y}_2 = \beta_0 + \beta_1 \text{(when } D_{1i} = 1, D_{2i} = 0\text{)}$$
$$\bar{y}_3 = \beta_0 + \beta_2 \text{(when } D_{1i} = 0, D_{2i} = 1\text{)}$$
$$\bar{y}_4 = \beta_0 + \beta_1 + \beta_2\beta_3 \text{(when } D_{1i} = 1, D_{2i} = 1\text{)}$$

(11)
$$income_i = \beta_0 + \beta_1 Sex_i + \beta_2 Educ_i + \beta_3 Sex_i Educ_i + \epsilon_i$$