

# STAT 8004, Homework 1 REDO

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November 18, 2014

**Problem 1.** (30 points, 10 for each sub-problem)

Please use  $\text{\LaTeX}$  to input the following math equations.

a).

$$\begin{aligned} f(y \mid \psi) &= \prod_{i=1}^n \rho_{ij} \\ &= \prod_{i=1}^n \frac{\exp[u_{ij}(x_i, z_j)]}{\sum_{l=1}^p \exp[u_{ij}(x_i, z_l)]} \end{aligned}$$

b).

$$\begin{aligned} \mathbf{V} &= \int_0^1 \int_0^{\sqrt{1-x^2}} 2x^3 y \, dy \, dx \\ &= \int_0^1 x^3 y^2 \Big|_{y=0}^{y=\sqrt{1-x^2}} \, dx. \end{aligned}$$

c).

$$\begin{pmatrix} \Omega' & \frac{1}{2}C' \\ C & 0 \end{pmatrix} \begin{pmatrix} x \\ \lambda \end{pmatrix} = \begin{pmatrix} \omega \\ 0 \end{pmatrix}$$

**Problem 2.** (10 points) Let  $X = 0, 0.01, \dots, 2$ , and let  $Y = \sin(X)$ . Plot  $Y$  vs  $X$  in R. The  $x$ -axis should correspond to the variable  $X$  and the  $y$ -axis should correspond to the variable  $Y$ . Please put the figure here, and caption it as “A figure to show relationship between  $X$  and  $Y$ ”.

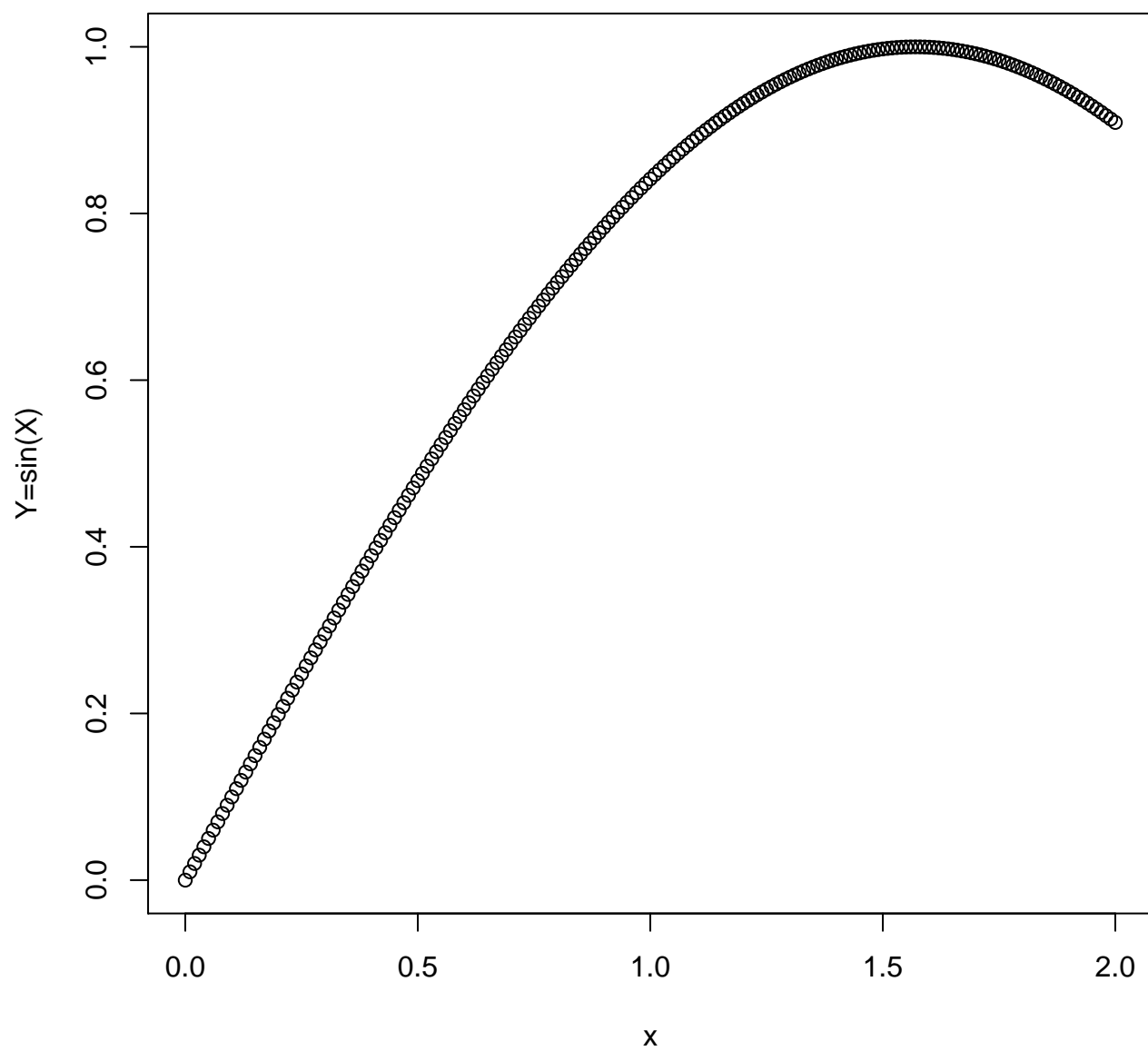


Figure 1: A figure to show the relationship between  $X$  and  $Y$