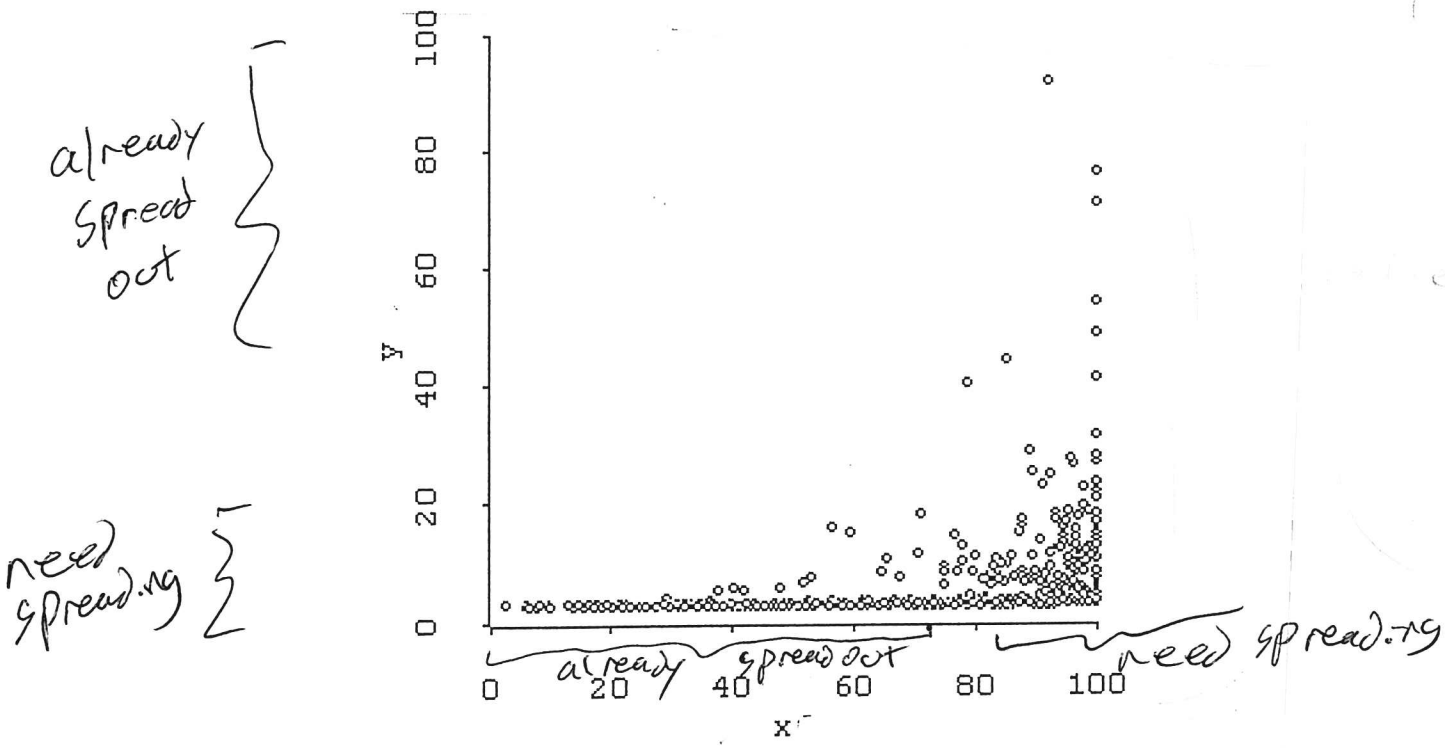
Math 484 Quiz 6 Fall 2016 Name_____



$\log(x) \to \lambda = 0$ $x^2 \to \lambda = 2$

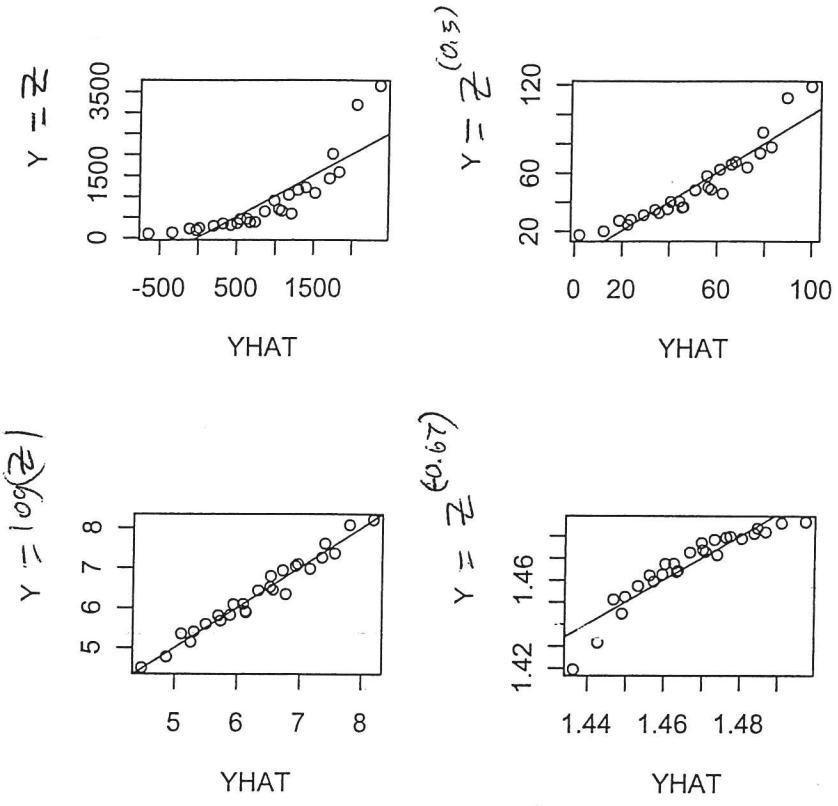
1) a) In the plot of x versus y above, $\lambda = 1$. Which transformation will increase the linearity of the plot, $\log(x)$ or x^2? Explain.

x^2 spread large values of x, so make λ larger

b)In the plot of x versus y above, $\lambda = 1$. Which transformation will increase the linearity of the plot, $\log(y)$ or y^2? Explain.

$\log(y)$ spread small values of y so make λ smaller

50



2) Suppose a client is investigating the behavior of worsted yarn under cycles of repeated loadings. Let Z be the number of cycles to failure and the three predictors are the length, amplitude and load. Four models are being considered where $Y = Z$, $Y = \log(Z)$ or

$$Y = Z^{(\lambda)} = \frac{Z^{\lambda} - 1}{\lambda}$$

for $\lambda = 0.5$ and -0.67. The above plots are the response plots where the fitted values $\hat{Y}$ are computed by regressing Y on the three predictors. Which MLR model should be used, the response with $Y = Z$, $Y = \log(Z)$, $Y = Z^{(0.5)}$ or $Y = Z^{(-0.67)}$?

$Y = \log(Z)$