STA 302 / 1001 (A. Gibbs)
Solutions to Additional Practice Problems for Chapter 3 of Sheather

1. The residuals are a linear function of the $y_i$'s. So a graph of $\hat{e}_i$ versus $y_i$ will always show a pattern. The residuals are uncorrelated with $\hat{y}_i$ so a plot of $\hat{e}_i$ versus $\hat{y}_i$ should show no pattern if the linear regression model is appropriate.

2. Transforming $x$ does not affect the distribution of the error terms; transforming $y$ does. The error variance will no longer be constant after a $1/y$ transformation.