Test Correction

1, (b) and (d) are both invalid.

2, (a) and (c) are both invalid.

4, (c) and (d) is not aided by residual plot.

5, (a) and (b) do not require assessing for normality and randomness.

7, We know $R^2 = 0.06$, which means only 6% of variability in the response variable is explained by the model. Since $R^2 = \frac{SSM}{SST} = 1 - \frac{SSE}{SST} = 0.06$, we know SSM has to be less than SSE. In other words, only 6% of variability in the response variable is explained by the model due to large residuals, thus large sum square of residuals (SSE), therefore $SSM \approx SSE$ or $SSM < SSE$ for this specific data presented in the comic.

8, Most points are along the line normal quantile plot, but (a) histogram for residuals show binomial pattern and potential outliers, so we may not assume normality of residuals. Residual plot shows most points are scattered on the plot randomly, and we don't see any funneling of points, so we can assume linearity and equal variance for the model. Also, there are no reason to suspect for dependencies among data points, and the sample was collected through simple random sample, so we may assume independence and randomness of data.

8(b) Normal quantile plot, residual plot, and histogram will not change because change of units in the predictor variable does not influence the values for residuals or predicted values.

9(a) Estimate for the standard deviation of the number of calories burned based on the linear model is 30.84 calories.