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Test Corrections 1

8a) Linearity: Based on the residual plot, the data does look linear because there are an equal number of points above and below the x-axis

Uniform Spread: Although there are more points to the left of the plot than the right, there does not seem to be any major funneling. There are a couple points that make the spread slightly wide but that is only in two locations and there are no evident trends. There would clearly be constant spread without those two points (I circled those on my test paper)

Normality: Based on the normal quantile plot, the data does seem to be normally distributed because most data points fall on the diagonal line. The highest and lowest residuals are both off the line, suggesting there might be slightly heavier tails, but this is not a trend involving multiple points. Based on the studentized residuals, we can see that there are heavier tails, since the 2 influential data points (one at each end) are more than 2 standard deviations from the mean.

We cannot check any other assumptions based on these plots, but we can assess them based on other information we have:

Zero Mean: we can assume this

Independence and Randomness: Since the data is from a simple random sample, we are able to conclude that the data is independent and random

8b) No. this change is simply a conversion between proportional units, not a transformation. Since only the units are changing, the standardized or studentized version of the data would not be any different, so the properties and characteristics of the plots would not change. Only transformations that are powers or logarithms would change the shape of the plots. With this proportional change, the scale of the x-axis would change but not where the datapoints lie in relation to each other. Moreover, since only the predictor units are changing, the y-values will change the same. Residuals are calculated using the y-value, $(\hat{y} - y_i)$, so the e_i values will be the same. Therefore, both residual plots shown above will stay the same. The transformation doesn't change the shape of the graphs (how the points are related to one another) so the normal probability plot will also stay the same.