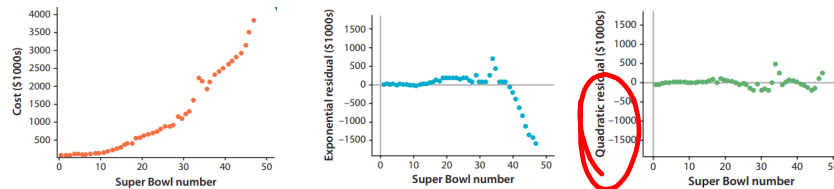


2.8 Fitting Models to Curved Relationships Part 3: Choosing a Model

In some cases, it is hard to tell if a quadratic model or an exponential model would be better to use.

To decide, look at the residual plots for both models and choose the model with the residual plot that has the most scatter.

Example: In the last section, we looked at the relationship between the cost of a 30-second commercial during the Super Bowl and the Super Bowl number. The first scatterplot clearly shows that the relationship is nonlinear. An exponential model and a quadratic model were calculated for the relationship between cost and Super Bowl number. Here are the residual plots for these models. Based on the residual plots, which model is more accurate? Explain.



Since there is more scatter. We are uncertain about what the rest of the plot will follow.

For the most recent Super Bowls, predictions from the exponential model are consistently too high and the size of the difference is getting bigger with each passing year.

In Super Bowl 47, the prediction is off by more than \$1.5 million!

The residual plot for the quadratic model has some leftover patterns, but it is definitely more scattered than the exponential model and the residuals are typically much smaller as well.