Chapter 4 – Worked Solutions to the Problems

Hints

1.   a.   There are two simple methods to determine if a particular model is appropriate – examining a scatterplot of the data, and examining a residual plot of the data. The scatterplot looks linear and the residual plot shows no strong underlying patterns.

2.   If your r^2 value is too large, should you move points close to the line further from the line, or should you move points far from the line nearer the line?

Chapter 4 – Worked Solutions to the Problems

1. a. There are two simple methods to determine if a particular model is appropriate
        – examining the scatterplot of the data, and examining a residual plot of the data.
        The scatterplot looks linear and the residual plot shows no strong underlying
        patterns. A linear model is appropriate for this dataset.

    b. From diagram B, the linear model is $L(t) = 9.319t – 61.12$ where $L(t)$ is the amount
        of lean in year t, and t is the number of years since 1900.   For 1918
        $$L(18) = 9.319 \times 18 - 61.12$$
        $$= 106.6$$
        The linear model predicts that the lean in 1918 was 2.9107 centimetres.

    c. The actual lean in 1918 was 2.9071 metres. Given the slow rate at which the lean
        changes, this difference is significant. The model is not accurate when
        extrapolating back to 1918.

2. Answers will vary.