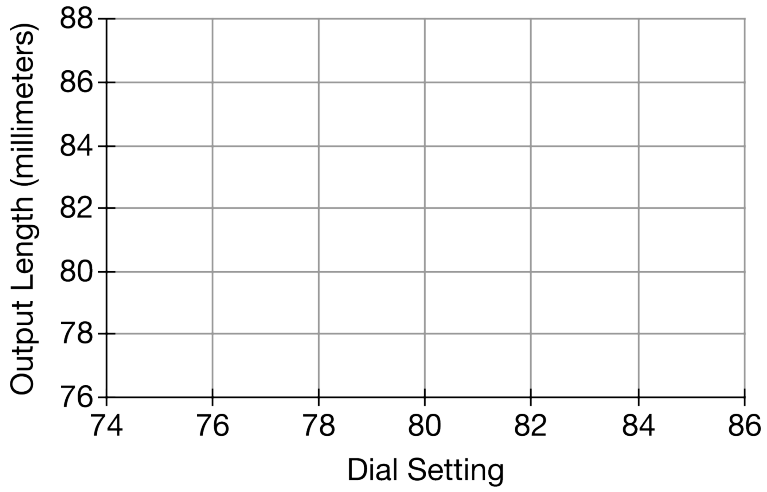
Unit 9 Progress Check: FRQ

1. Show all your work. Indicate clearly the methods you use, because you will be scored on the correctness of your methods as well as on the accuracy and completeness of your results and explanations.

At a plant that manufactures bars of steel, a machine is used to cut the bars to specific lengths. The machine has a dial that sets the length of the bars to be cut. However, the dial is currently out of alignment and the plant manager is collecting data to assess the situation. The following table shows 8 trials at different dial settings along with the actual output length of the bars that were cut. All measurements are in millimeters.

Dial Setting	Output Length
75	78
77	79
79	82
80	83
81	85
82	83
83	86
85	88

(a) Use the following grid to construct a scatterplot in which dial setting is the explanatory variable and output length is the response variable. Based on your graph, does a linear model seem appropriate? Justify your answer.



(b) Use the data to construct a least-squares regression line to predict output length from dial setting.

(c) Assume that all conditions for inference are met. Indicate the hypotheses appropriate to test whether there is a linear relationship between output length and dial setting.

Unit 9 Progress Check: FRQ

(d) The test statistic for the appropriate test is $t = 9.018$. Do the data provide convincing statistical evidence that there is a linear relationship between output length and dial setting?