

Worksheet: Data for quadratic regression
Mr. Chvatal

Name: _____
Per.: _____

Maple sap production vs. tree age

| Tree age (in years) | Sap production (in ml) |
|------------------------|---------------------------|
| 7 | 200 |
| 50 | 350 |
| 10 | 370 |
| 17 | 380 |
| 35 | 480 |
| 8 | 280 |
| 27 | 420 |
| 40 | 430 |
| 12 | 320 |
| 45 | 360 |
| 22 | 480 |
| 42 | 390 |
| 30 | 430 |
| 37 | 450 |

Linear regression

- 1) Use your calculator to graph a scatterplot of the data. Sketch it above, making sure to properly label your graph.

- 2) Derive a linear model for the data, rounding to three places. Write it below.

- 3) Use the linear model to predict the sap production from a 20-year-old maple tree.

- 4) a) What is the value of the correlation coefficient? b) In general, what do correlation coefficient values indicate? c) What does this value tell us about this linear model in particular?

- 5) a) What is the value of the coefficient of determination? B) Specifically, what does this tell us about how variability in age accounts for variability in sap production in our linear model?

Quadratic regression

- 6) Derive a quadratic model for the data, rounding to three places. Write it below.
- 7) Use the quadratic model to predict the sap production from a 20-year-old maple tree.
- 8) a) What is the value of the coefficient of determination? B) Specifically, what does this tell us about how variability in age accounts for variability in sap production in our quadratic model?
- 9) Compare the results of the linear model versus the quadratic model. Which is the better predictive model?