Algebra 2

2-05 Write Quadratic and Polynomial Models (4.9)

Find a Polynomial Model Given *x*-intercepts

- 1. Write a polynomial model in the form $y = a(x k_1)(x k_2)(x k_3)$... where there is one factor per _____
- 2. Substitute the *x*-intercepts for the _____.
- 3. Substitute the other point for _____.
- 4. Solve for _____.
- 5. Write the _____ function.

Write a polynomial model with *x*-intercepts are –2, 1, 3 and (0, 2)

Find the Degree of a Polynomial Using Finite Differences

- 1. Have a table of values with ______ spaces _____.
- 2. Find the ______ of successive ______.
- 3. Find the ______ of successive ______ from the previous step.
- 4. Repeat until all the differences in a step are the _____ number (not zero).
- 5. The number of ______ of differences is the ______ of the function.

Find the degree of the polynomial passing through (0, 1), (1, 6), (2, 25), (3, 70), (4, 153), (5, 286)

Finding a model given several points

- 1. Use ______ difference to find the ______.
- 2. Use either of the following methods.
 - a. Method 1: Solve a System of Equations by Hand (This lesson uses Method 2)
 - i. Write a general polynomial function of the given degree such as $y = ax^3 + bx^2 + cx + d$.
 - ii. Substitute a point for x and y to get an equation where the variables are the coefficients.
 - iii. Substitute another point in the general polynomial for *x* and *y* to get a second equation where the variables are the coefficients.
 - iv. Continue substituting points until there the same number of equations as coefficients.
 - v. Solve the system of equations using something like elimination to find the values of the coefficients.
 - vi. Write the equation by substituting the coefficients into the general polynomial.
 - b. Method 2: Use a ______ on a _____

Algebra 2 2-05 Finding Linear Regression on a TI-84

- 1. Push STAT and select Edit....
- 2. Enter the *x*-values in List 1 (L1) and the *y*-values in List 2 (L2).
- 3. To see the graph of the points
 - a. Push Y= and clear any equations.
 - b. While still in Y=, go up and highlight Plot1 and press ENTER.
 - c. Press ZOOM and select ZoomStat.
- 4. Push STAT and move over to the CALC menu.
- 5. Select the type of regression.
- 6. Make sure the Xlist: is L1, the Ylist: is L2, the FreqList: is blank, and the Store RegEQ: is Y1.
 - a. Get Y1 by pressing VARS and select Y-VARS menu.
 - b. Select Function....
 - c. Select Y1.
- 7. Press Calculate
- 8. The calculator will display the equation. To see the graph of the points and line, press GRAPH.

Finding Linear Regression on a NumWorks graphing calculator

- $1. \quad \text{On the home screen select Regression.}$
- 2. In the Data tab, enter the points.
- 3. Move to the Graph tab.
- 4. The default is a linear regression and is displayed at the bottom of the screen. To change the regression type
 - a. Press OK.
 - b. Select Regression.
 - c. Select the desired regression type.

Find a polynomial function passing through (1, -2), (2, 2), (3, 12), (4, 28), (5, 50), (6, 78)

Best-Fitting Polynomial Models

- 1. Real-life usually ______ fit a model _____, so finite differences _____ work.
- 2. Use a ______ find regressions of ______ degrees.
- 3. Choose the one that seems to fit the data the best as shown on the _____