USING GRAPHING CALCULATORS IN CORE ALGEBRA II CLASS

Mary Rumpel
Ellsworth High School
30 years of teaching
rumpelm@ellsworth.k12.wi.us
CURRICULUM HIGHLIGHTS

Pearson Book with MathXLforschool

Ch 4 Quadratics (and Absolute Values)
- Translations of Absolute Values
- Translations of Quadratics
- Vertex/Max/Min/Domain/Range – graphing of Parabolas
- Modeling with Parabolas
- Factoring/Solving Quadratics
- Given ordered pairs, find equation
- Quadratic Formula/Complex Numbers
- Did NOT teach completing of the square to Core class

Sample Review and Test
- Review of 1st half
- Test
Ch 5  Polynomials

- Identify graphs of different degrees/end behaviors/Relative max/mins
- Find zeros of functions using factoring and graphs
- Cube formula factoring and factor by grouping
- Finding equation given roots/given complex roots
- Compare regression lines of data to choose a reasonable model
  Modeling Wkst
- Finding all roots using graphing calculator, DesCartes, synthetic division
  DesCartes Wkst  Answer Key
- Transformations of perfect cubes graphs
- Determine degree of function given table of ordered pairs

THE MODELING WAS DONE ON ASSIGNMENTS NOT ON TEST, THEY USED CALCULATOR TO FIND THE ROOTS ON TEST
A rectangular piece of cardboard 28 by 32 inches has squares cut out of each corner to form a box.

Write an equation of the volume of the box.

\[ V = l \cdot w \cdot h \]
\[ V = (32 - 2x)(28 - 2x) \cdot x \]
\[ (x, 1980) \]

Sin increment
\[ 1980 \text{ in}^3 \text{-Volume} \]

For each set of data, compare two models and determine which one best fits the data. Which model seems more likely to represent each set of data over time?

**World Population**

<table>
<thead>
<tr>
<th>Year</th>
<th>Average Growth Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1972</td>
<td>1.96</td>
</tr>
<tr>
<td>1980</td>
<td>1.73</td>
</tr>
<tr>
<td>1992</td>
<td>1.5</td>
</tr>
<tr>
<td>2002</td>
<td>1.22</td>
</tr>
<tr>
<td>2012</td>
<td>1.13</td>
</tr>
<tr>
<td>2020</td>
<td>1.07</td>
</tr>
</tbody>
</table>

Let \( x \) = years since 1972

Approximately what should the world population be in 2020?
DID NOT SOLVE RADICAL EQUATIONS WITH CORE

**Ch 6 Radicals**

- Break down roots of numbers and/or variables – Find perfect roots
- Add/Subtract/Multiply/Divide roots
- Rationalize denominators
- Rational exponents
STUDENTS LOVED THIS CHAPTER – THE EXPONENTIAL EQUATIONS DEFINITELY MADE SENSE TO THEM AND THEY AGREED THAT THEY MAY USE THESE FORMULAS IN FUTURE
EXAMPLES OF MODELING DURING CLASS
USED GRAPHING CALCULATOR ALMOST EVERY DAY IN THIS CHAPTER – VERY VISUAL
Ch 11 Statistics and Probability

- Mean, median, mode, percentiles, standard deviation, variance
- Box Plots, $Q_1$, $Q_3$, IQR, range
- Normal curve – empirical rule
- Z-scores – find them, use z-chart to find proportion of “below”, “above”, “between”
- Baseball Project
- Counting Theorem – factorials
- Probability – Venn diagrams and Contingency tables

USED CALCS FOR 1-VARIABLE STATS STUFF, THEY ALSO ENJOYED USING THE !, P, C BUTTONS – I DIDN’T SHOW THEM Z-SCORE BUTTONS
Ch 12 Trigonometry

- Reviewed right triangle basics – SOH-CAH-TOA
- Unit Circle – coterminal and reference angles
- Radians
- Special Triangles – did a LOT with this
  - Sin/cos/tan of radian and degree special angles
  - Given special triangles, find missing pieces without Pythagorean Theorem
  - Found Area of real-life figures
  - Sin/cos/tan of angles landing on x&y-axis
- Reciprocal Trig Functions

Harmonic Motion Wkst

NOT MUCH USE OF CALCS IN THIS CHAPTER – IN REGULAR ALGEBRA II WITH HARMONIC MOTION WE USE THEM ALOT
I had moved this chapter to the end of the year and because of this, I didn’t have a lot of time to create good modeling days – it really sets itself up for it, though.

Ch 9 Sequences and Series

- Recognize patterns – write and use explicit and recursive formulas
- Arithmetic Sequences and Series
- Geometric Sequences, series, and infinite series
Credits: