Casa Grande Union High School

Teacher: Connie Dolezal

Fellow: Victor I. Piercey

Connie Dolezal was born and raised in a small town less than half the population of Casa Grande Union High School. In 1993, the Dolezal family moved to Arizona where she has taught ever since. She has taught math at Desert Winds, Casa Verde, and the main campus, everything from Basic Math through Calculus. Her daughter, Casey, is a teacher at Palo Verde Elementary School in Casa Grande and her husband, Ted, works for Homeland Security at the Phoenix International Airport. Aside from doing math for fun, Mrs. Dolezal enjoys traveling and reading.

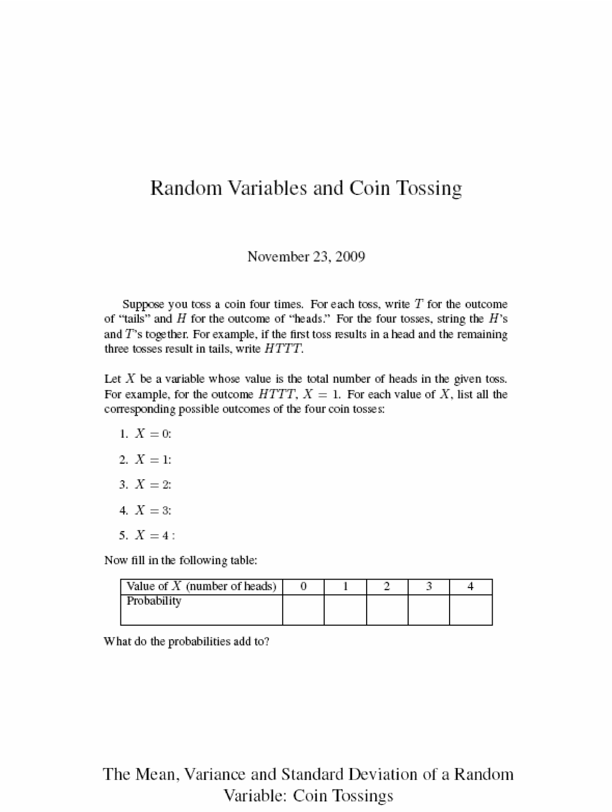
Victor Piercey is originally from Kalamazoo, Michigan. Before studying mathematics, Victor earned a J.D. from Columbia Law School and practiced law in New York City for two years. After September 11, 2001 Victor decided to change careers and is now a Ph.D. candidate in Mathematics at the University of Arizona. He studies Algebraic Geometry with Yi Hu. His wife, Courtney, is pursuing a D.M.A. in vocal performance at Arizona State University. When not studying, Victor likes to travel with his wife, read, play guitar, learn foreign languages, and go to the movies.

A.P. Statistics

Activity on the Logic of Significance Tests:

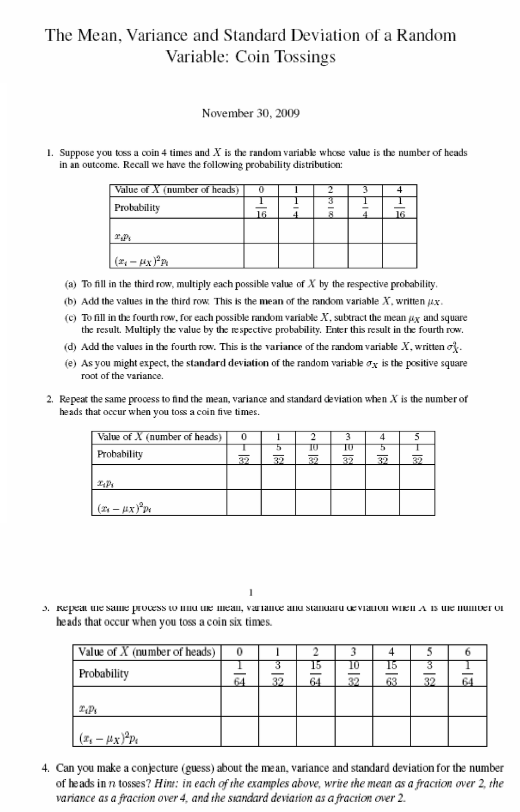
We have three decks of playing cards. For each deck, we formulate the hypothesis that half of the cards are red.

1. Several students choose a card from the first deck while the number of red and black cards are tabulated on the board. Based on these results, we determined that it was unlikely that half of the deck was red (the actual ratio was 1/3 red and 2/3 black).
2. We repeated the procedure with the second deck but could not reject the hypothesis (this deck was evenly split between red and black cards).
3. For the third deck, each student took a sample of two cards and we recorded the proportion of red cards for each sample. Based on the evidence gathered, we rejected the hypothesis in favor of the alternative that there were more red cards than black (in fact 2/3 of the third deck were red cards).



Random Variables and Coin Tossing

November 23, 2009



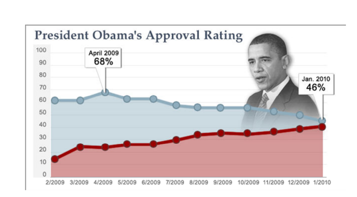
The Mean, Variance and Standard Deviation of a Random Variable: Coin Tossings

November 30, 2009

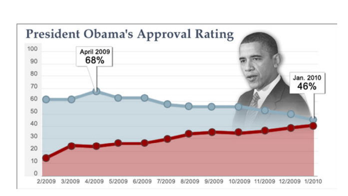
In this series of handouts, students worked with outcomes of coin tosses to learn about random variables. The second handout extended the same example to illustrate the mean, variance and standard deviation of a random variable. The last question asks students to formulate conjectures based on patterns. These conjectures were later confirmed when the binomial distribution was studied.

A high point of a statistics class is learning to interpret statistics in the news. When we studied confidence intervals, we dissected a presidential approval poll.

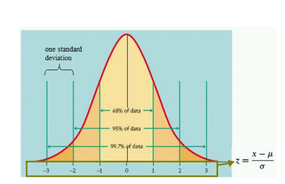
When we studied statistical significance, we dissected studies that claim pizza consumption reduces cancer risk.



CBS News Poll: January 11, 2010:
President Obama's Approval: 46%
Results Come From SRS of 1216 Adults.
Margin of Error: +/- 3%, Confidence Level: 96%



Goal: Estimate Percent of Adult Americans Who Approve of the President's Job Performance
Survey Results: 560 Adults Surveyed Approve
Estimate: p = 560/1216 = 0.46



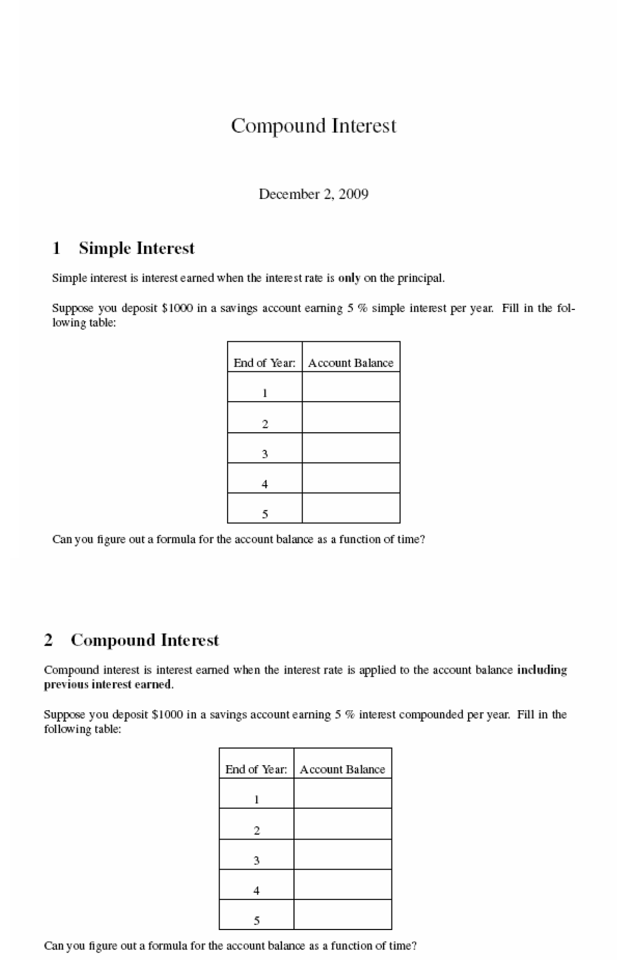
Critical Values

For a given confidence level *C*, use the critical value z* to determine how many standard deviations about the mean include C% of the distribution.

Confidence Intervals for a Proportion of a Population

Recall: the Confidence Interval is always:
Estimate +/- Margin of Error
The Margin of Error for p is:
+/- z* SE
The Confidence Interval is:
p +/- z*SE

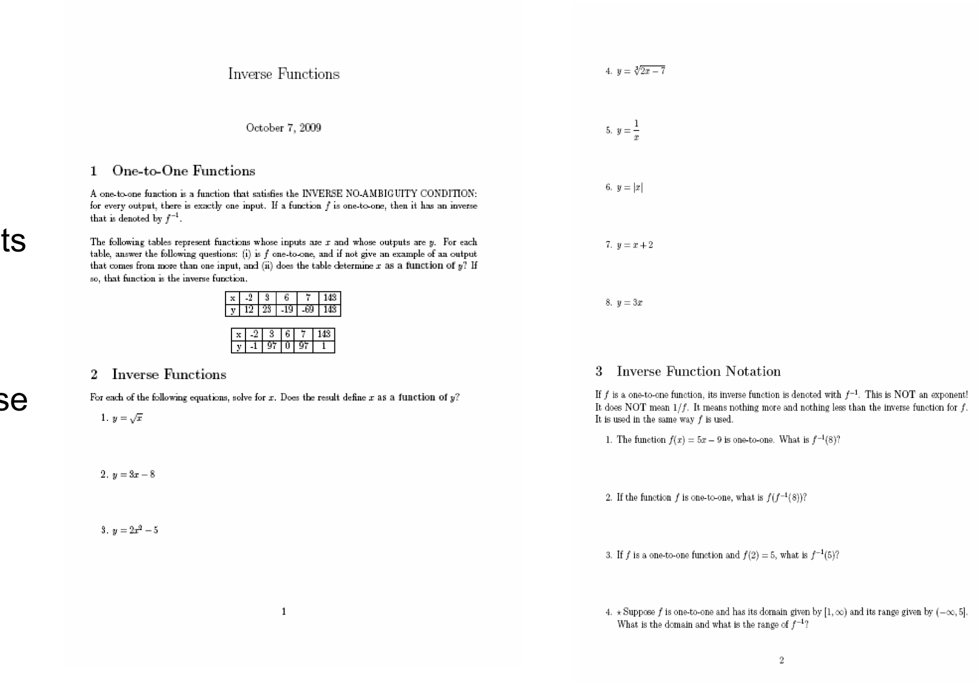
Algebra 5 and Trigonometry



Compound Interest

December 2, 2009

One of the challenges that Victor embraces is trying to help students develop the ability to "think mathematically" and solve unfamiliar problems, such as those in the third section of the handout to the right.



Inverse Functions

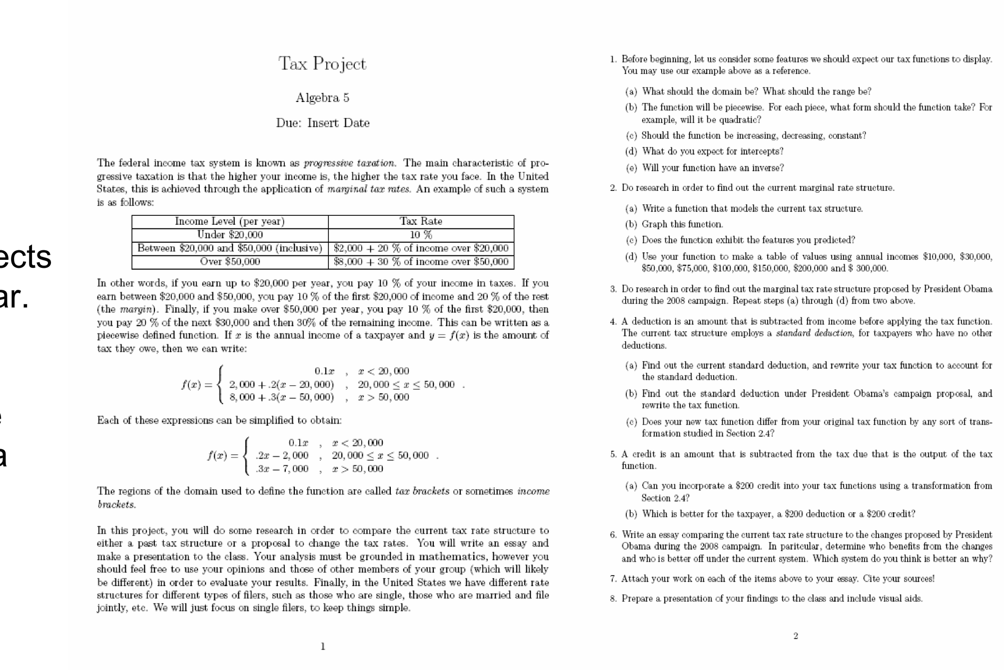
October 7, 2009

Victor's background includes economics, law and physics. This allows him to bring several applications into the classroom.

Compound interest is arguably the most important application in the Algebra 5 curriculum.

Below, Victor and the students maximize a profit function for a firm facing a downward sloping, linear demand curve.

Victor is working on putting together projects for the end of the year. The focus will be on using the functions studied in the course to model phenomena in the real world.



Tax Project

Algebra 5