Math in the Media

Dr. Dona V. Boccio
Queensborough Community College
The City University of New York
Bayside, NY 11364

dboccio@qcc.cuny.edu
(718) 631-6361

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The public is inundated with mathematical information, designed to sell us products, amuse, and entertain us. This talk examines the mathematics behind statements made in movies, TV commercials, and sitcoms, as well as mathematical assertions found in printed media. We will watch videotapes and examine, analyze, and challenge the claims made. Ways in which these videos could be used in a classroom setting will be discussed. We will also explore how the concepts can be adapted and extended for group projects, lab projects, etc.

Necessary mathematical background includes basic algebra, trigonometry, and probability. The examples presented here will be of interest to instructors and students of elementary and intermediate algebra, pre-calculus, liberal arts mathematics, and business mathematics.

I. SEINFELD EPISODE: "The Tip Calculator"

Jerry's father Morty is trying to determine the amount of the tip on a lunch bill.

Morty: Service was slow, and God forbid they should refill the water. How does 12.4% sound?

Jerry: Your tip is $4 and 36.6666 cents.

Morty: We'll round down.

How much was the bill? Is this possible?

II. BILLY BATHGATE

Berman is the accountant who runs the numbers operation for the mobster Dutch Schulz.

Berman: Count how much change is in your pocket, but don't tell me. Now double it and add 3. Product it by 5. Subtract 6. Tell me what you come up with.

Billy: 279

Berman: You just lost 27 cents.

How did Berman determine how much change Billy had? Try this with others in your group. Will this method always work? Why does it work?

Would the method work if you subtract 7 instead of 6? If you subtract 5?

The following is an excerpt from the novel:

He said one afternoon, "Hey, kid, how many months in the year?" I answered twelve. "Okay, now suppose you give each month its number, like January is the first month and so on, you got it?" I said I did. "Okay, now you don't tell me your birthday but take the number of the month, and then add the number of the month following, you got it?" I had it, I was thrilled he was talking to me. "Okay, now product that sum by five, you got it?" I thought a moment and then said I had it. "Okay, now you product by ten and add the number of your birthday to the result, you got it? All right, yes, I had it. "Now give me the number you come up with." I did-nine hundred and fifty-nine. "Okay," he said, "thanks for telling me, your birthday is September nine."

How did Berman determine Billy's birthday? Try this with others in your group. Will this method always work? Why does it work?

III. SUN AMERICA ADS

Ad #1: At $6500, that watch could cost you $30,296 in retirement savings.

Ad #2: This $70,000 car could cost you $326,267 in retirement savings.

Ad #3: With that same $13,000, she could have $60,296 for her retirement.

The fine print on all three ads reads "Hypothetical example assumes 8% pretax annual growth compounded over 20 years".

Are the conclusions correct?

IV: SEINFELD

Jerry's Uncle Leo was supposed to give Jerry's mother $50 that their father had won at the racetrack in 1941. Nana says to Leo, "your father won $1000 at the track last week and he gave you $100, and you were supposed to give $50 to your sister".

When Jerry's father, Morty, finds out, he says:

"Do you know what the interest on that $50 comes to over 53 years? $663.45
And that's figuring conservatively at 5% interest over 53 years, compounded quarterly".

Is Morty correct?

V. RUNNER'S WORLD

The following is an excerpt of an article that appeared in the March 2000 issue of Runner's World, with the accompanying illustration:

"That hill probably isn't as steep as you think … people often overestimate the steepness of a hill… most people estimated hills to be three times as steep as they really were".

Can you find an error in the diagram?

Using the formula in the diagram, calculate the value of angle θ for elevation gains of 10 ft. per 100 ft, 20 ft per 100 ft, 30 ft per 100 ft, etc. (i.e., use x = 100 ft, y = 10 ft, y = 20 ft., etc). Now find the correct formula, do the calculations again and compare your results. (Could this be why the runners thought the hills were steep)?

VI: SMILES OF A SUMMER NIGHT

Count Malcolm and Attorney Egermann are having a "duel". Count Malcolm explains the rules:

"This gives us exactly even chances. The revolver has only 1 bullet. You close your eyes, roll the cylinder, point the weapon at your temple, and press the trigger. Each repeats the procedure twice. The odds are thus 12 to 2."

"Now I'll spin the weapon. Whoever the muzzle points to goes first."

Is the Count correct in his calculation of the odds?

VII. SEINFELD: 646 AREA CODE

Elaine gives her phone number to a potential date. He asks, "What's 646"? She responds: It's the same as 212, they just multiplied it by 3, then they added 1 to the middle number.

Can you write Elaine's algorithm as a mathematical formula? Can you think of other ways to convert 212 to 646?

Try to find formulas for converting between other area codes in neighboring regions.

VIII. BULL DURHAM

Crash states: "Do you know what the difference between 250 and 300 is? It's 25 hits. 25 hits in 500 at bats is 50 points, ok? There are 6 months in a season. That's about 25 weeks ... That means if you get 1 extra [hit] per week … just one more [hit] per week … and you're in Yankee Stadium. "

Is this correct?

Suppose the season is _ over, and the player is hitting 250. How many more hits will he need to get so that his batting average will be 300 by the end of the season?

IX. SEINFELD: 9999 BOTTLES AND CANS

9999 bottles and cans. At 10 cents a bottle and 10 cents a can, we're pulling in $500 a man.

REFERENCES:

Doctorow, E. L. *Billy Bathgate*. New York, NY: HarperPaperBacks, 1989. (See pages 89-90).

Runner's World, Volume 35, Number 3, March 2000. (See page 19).