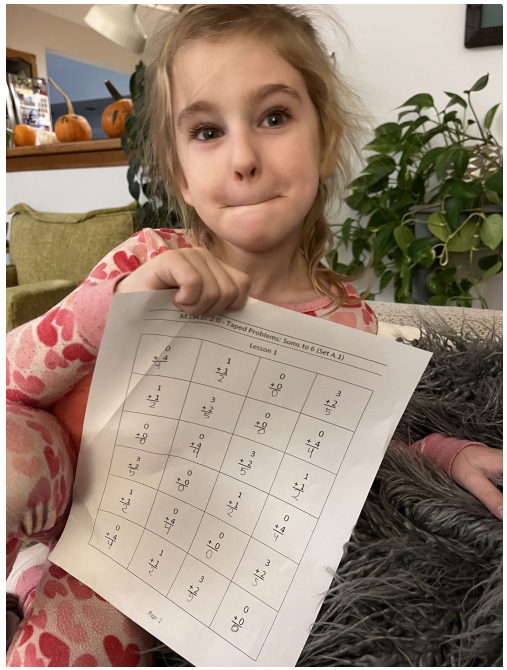
Breaking The Code: The Enigma of Alan Turing

Wednesday, November 19



Handouts:

Assignment 28

Some Notes on Exam 2

Safire's Fumblerules

Preview of Coming Attractions

- Registration Check
  Add–Drop Period
- Feedback on Exam 2
- Feedback on Essay 2 Writing
- Discussion of *New Yorker* Article (if time)
- Friday, November 21:
  Team Written Reports Due
- More Myths About Alan Turing
- Discussion of Updegrove's Novel (After Break)

Comments About Exam 2

Median Score: 88
Range of Scores: 79 – 100

Most Common Source of Lost Points:

Galileo's Paradox: Lack of Specificity

Halting Problem: Lack of Detail

$\sqrt{5}$is Not a Rational Number: Key Step is Unproven

$\sqrt{5}$ is Not Rational

Proof: Assume, to the contrary, that $\sqrt{5}$ is rational.
Then we can write $\sqrt{5} = \frac{a}{b}$ where a and b have no common factor bigger than 1
Thus $a^2 = 5b^2$ so a^2 is a multiple of 5.
Hence a must be a multiple of 5.
So $a = 5k$ for some integer k and $5b^2 = a = 25k^2$
which means $b^2 = 5k^2$ is also a multiple of 5
implying that b is also a multiple of 5,
contradicting the fact that a and b have no such common factor.
Since we have reached a contradiction,
the initial assumption must be false.
Hence $\sqrt{5}$ is not rational.

Claim: If a^2 is a multiple of 5, then a must be a multiple of 5

If a is not a multiple of 5, then it must be of the form $5k+1, 5k+2, 5k+3$ or $5k+4$ where k is an integer.

But

$$(5k+1)^2 = 25k^2 + 10k + 1 = 5(5k^2 + 2k) + 1$$

which leaves a remainder of 1 when divided by 5

$$(5k+2)^2 = 25k^2 + 20k + 4 = 5(5k^2 + 4k) + 4$$

which leaves a remainder of 4 when divided by 5

$$(5k+3)^2 = 25k^2 + 30k + 9 = 5(5k^2 + 6k + 1) + 4$$

which leaves a remainder of 4 when divided by 5

$$(5k+4)^2 = 25k^2 + 40k + 16 = 5(5k^2 + 8k + 3) + 1$$

which leaves a remainder of 1 when divided by 5.

blue **Some Myths About Alan Turing**

Turing Died After Biting Into a Cyanide Laced Apple

ALAN M.

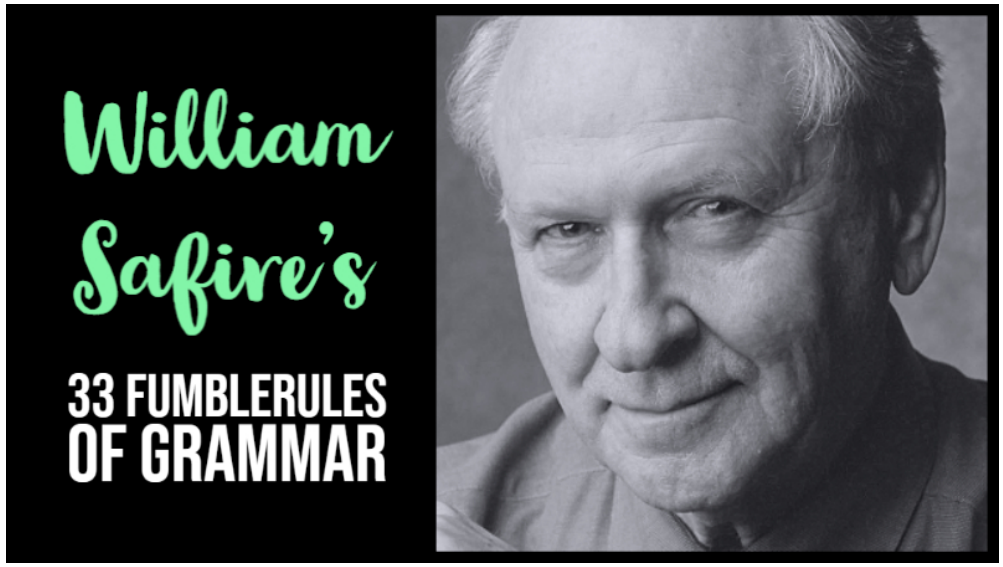
TURING

Centenary Edition

SARA TURING

Some Feedback on Essay 2 Writing

- Identify Your Audience and Keep it in Mind
  Examples: Response to Turing's Mind Paper
  and Term Project
  Explain Terms (Jargon)
- Construct Outline so Paper has Solid Orgainization
- Avoid Overlong Paragraphs
- Avoid Repetition of Same Word in Single Paragraph
- Provide Full Details of Work Cited in Your Bibliography
- Don't Trust AI
- Pay Attention To Basic Grammar
  Usage of **I** vs **Me**
  My brother Fred and me hate asparagus.
  My robot loves Fred and I.



William Lewis Safire (December 17, 1929 – September 27, 2009)
American author, columnist, journalist, and presidential speechwriter

William Safire's Rules for Writers:

- Remember to never split an infinitive.
- The passive voice should never be used.
- Do not put statements in the negative form.
- Verbs have to agree with their subjects.
- Proofread carefully to see if you words out.
- If you reread your work, you can find on rereading a great deal of repetition can be by rereading and editing.
- A writer must not shift your point of view.
- And don't start a sentence with a conjunction. (Remember, too, a preposition is a terrible word to end a sentence with.)
- Don't overuse exclamation marks!!
- Place pronouns as close as possible, especially in long sentences, as of 10 or more words, to their antecedents.
- Writing carefully, dangling participles must be avoided.

- If any word is improper at the end of a sentence, a linking verb is.
- Take the bull by the hand and avoid mixing metaphors.
- Avoid trendy locutions that sound flaky.
- Everyone should be careful to use a singular pronoun with singular nouns in their writing.
- Always pick on the correct idiom.
- The adverb always follows the verb.
- Last but not least, avoid cliches like the plague; seek viable alternatives.