Extra credit essay: Math 3510-001, Spring 03

I have listed three extra credit questions below, each accompanied by some of references. You can earn up to 50 points extra credit for writing an essay of 1200–1500 words that addresses one of these questions, using the given references. These are questions with no right or wrong answer. I am not even sure how I would answer them, even tho I have read all of the reference books listed.

If you intend to write an essay then you need to start reading the reference books very soon, since I expect a detailed outline of your final essay by Wednesday, 5 March. If you do not turn in an outline on this date then you will not be able to earn any extra credit. The final essay is due Wednesday, 30 April. In addition, you must give a short, 15-minute presentation to the class during finals week. (Date and time to be announced.) At your presentation you must bring your space-time posterboard.

I do not award extra credit points frivolously. If your essay rambles, or does not address the question directly, or does not support your answer with specific citations from the given references, or worse does not demonstrate clearly that you have read the given references, then you will earn 0 extra credit. Do a good job or don't bother with it at all.

1. Did the ancient Greek emphasis on rigorous proof lay the necessary foundation for modern mathematics, or did it skew the development? Is deductive proof based on clearly stated axioms a bane to practical applications?

   - *Journey thru Genius*, W Dunham.
   - *Crest of the Peacock*, GG Joseph.
   - *Diophantus and Diophantine Geometry*, IG Bashmakova.
   - *Enigmas of Chance*, M Kac.

2. Do mathematical concepts exist independent of people? In other words, would the mathematics of an extra-terrestrial species be the same (after translation) as ours?

   - *What is Mathematics, Really?*, R Hersh.
   - *A Mathematicians Apology*, GH Hardy.
   - *The Man Who Knew Infinity*, R Kanigel.
   - *A Beautiful Mind*, S Nasar.

3. Does progress in pure mathematics precede progress in science? Or do the needs of science determine the development of mathematical ideas?

   - *Hilbert*, C Reid.
   - *$E = mc^2$*, D Bodanis.
   - *Calendar*, DE Duncan.
   - *A History of π*, P Beckmann.