Math 300, Spring 2003, J. Baldwin

General Comments on Essay 2

1. Background: Be sure that you establish your point of view. Are you a customer, a consultant, an employee of Blocks Unlimited, of Ozimandias, an outsider describing the situation?

2. Context. It is ok to refer to the first essay but do so explicitly. The audience is not me but, perhaps, someone who has read the first essay and wants to know more.

3. Mathematics:

A) If you assert the total surface area of the blocks in the deluxe set is less than 12, give a reason. (This could either be a short explanation or a reference to the first essay.) In several papers, '12' just came out of the blue.

B) You *must* give a short complete argument that the deluxe set can be gilded for less than \$100. This argument must be completely accessible to a calculus student; thus, it cannot quote Euler's result that $\Sigma_1^\infty \frac{1}{n^2} = \frac{\pi^2}{6}$.

C) It would be nice to explain the difference between Euler's exact result and the kind of approximation that you can do easily.

D) The proof that the cost is at least \$90 should be completely understandable by a 6th grader. If your argument uses calculus you are working too hard.

E) There are a number of statements relating the area under a curve to the value of certain infinite sums. Check your logic in these discussion. Make sure you know the difference between 'and' and 'therefore'.

4. Mathematical writing.

A. Make sure you distinguish between mathematical expressions (or terms) which represent numbers and equations (which are either true or false).

B. Be sure that you describe infinite series when you intend to.

$$1 + \frac{1}{2} + \frac{1}{4} + \cdots + \frac{1}{n^2} + \cdots \tag{1}$$

is a series with infinitely many terms but a finite value.

$$1 + \frac{1}{2} + \frac{1}{4} + \cdots + \frac{1}{m^2} \tag{2}$$

is a series with finitely many terms and so of course a finite value.

Be careful that you don't write the second **expression** when you mean the first.

**General remarks on writing**

5. Too many words! When you think you have finished, proofread again. Try to shorten and clarify your sentences.

6. Don't weasel unless you intend to weasel! It is an important skill to qualify statements so you don't say things that a reader finds obviously false or offensive. The dual to that skill is to say clearly and simply those statements which can not be disputed.

7. The major verb of the sentence should carry the action. Don't write, 'It is important that the integral converges, because ...'. Rather write, 'Since the integral converges, ...'

8. Avoid the verb 'to be'. Whenever you see 'is' in your writing ask yourself, 'Why didn't I use a verb with meaning?'.

Compare the discussion of verbs in http://www.bartleby.com/64/C003/0160.html

9. Hopefully describes a state of mind. The child smiled hopefully as she held out our her hand for candy. We hope things will go well in the future. (If this example doesn't help, just type 'hopefully' on google.) The following site tries to defend the abhorrent usage: http://www.bartleby.com/64/C003/0160.html

10. Be careful with the use of infinitives, phrases like'to calculate'. When you see one in your writing, look for a shorter way to express the idea.