Perm number:

$\mathbf{Midterm}-\mathbf{in}\text{-}\mathbf{class} \ \mathbf{part}$

Time: 50 minutes

(1) Decide if the following statement is true or false:

 $[a \to (b \lor c)] \land [b \to \neg a] \land [d \to \neg c] \to [a \to \neg d].$

(2) How many integers between 1 and 800 inclusive are divisible by none of 4, 6, 8, 12, and 13?

- 2

(3) Use the principle of mathematical induction to show that $6|n^3 - n$.

3

(4) If a = 17 and b = 29, find d = gcd(a, b) and the integers s, t such that d = sa + tb.

4

(5) Solve the following quadratic equation:

$$z^{2} + (1+4i)z - (5+i) = 0.$$

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