

Problem 4 Suppose  $A$  and  $B$  are rings with identity  $1$ , and suppose that  $T:A \rightarrow B$  is additive and satisfies

$$T(1) = 1 \text{ and } T(A^{-1}) \subseteq B^{-1},$$

where  $A^{-1}$  and  $B^{-1}$  are the groups of invertible elements in  $A$  and  $B$ . Does it follow that  $T$  is multiplicative? Does it at least follow that  $T$  has the Jordan property

$$T(a_2 a_1 + a_1 a_2) = T(a_2)T(a_1) + T(a_1)T(a_2) ?$$

Problem 5 Suppose  $A$  is a ring with identity, and write  $A_{n \times n}$  for the matrices over  $A$ . If  $a \in A_{n \times n}$  has mutually commuting entries  $a_{ij} \in A$  and a left inverse  $b \in A_{n \times n}$ , must its determinant  $|a|$  have a left inverse in  $A$ ?

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A SHORT DICTIONARY OF MATHEMATICAL TERMS

*Des MacHale*

As a young graduate student I was frequently perplexed by certain words and phrases which cropped up again and again in the research papers which I attempted to read. Conventional Mathematics dictionaries gave me no help whatsoever, but experience has since taught me the true meaning of many of these expressions. For the benefit of those who find themselves in the same position, I offer a selection, in the hope that it will stimulate others to contribute to this sadly neglected area of mathematical education.

1. *The proof is left as an exercise:* I've lost the envelope on which I jotted this down, but it seemed reasonable at the time.
2. *While the results of Holland are relatively deep:* Holland once mentioned a paper of mine in his references.
3. *Formal Process:* I can't understand this for the life of me, but it seems to work.
4. *By far the most significant results in this field are due to Hurley:* Hurley is likely to referee this paper.
5. *I wish to thank the referee for a number of useful suggestions:* The old meanie cut me down from twenty pages to a miserable four.
6. *While only partial results have been obtained:* I've made no progress at all with this problem but I figured I could get at least one publication from it.
7. *It is well known that:* I'm not quite sure how to prove this and I'm hanged if I'm going to the trouble of finding out who first discovered it.

8. *Harte (oral communication) has shown that:* I cornered him and bored him to tears during a coffee break at a recent conference.
9. *A straightforward calculation gives:* A very difficult calculation, which took me the best part of a week, gives.
10. *Without loss of generality:* I can't handle the general case at all.
11. *Which completes the proof:* Which completes the proof, I hope.
12. *Evidently, clearly, obviously:* Maybe.
13. *Using a deep result of Vernon:* Vernon's work is completely beyond me, but I know a useful theorem when I see one.
14. *An interesting comparison might be made between the present results and those of Barry:* There is no connection at all, but his name looks great in my references.
15. *On pseudo-compact semiheaps with involution I:* I hope to get at least four papers out of this useless and obscure topic.
16. *This problem is of great theoretical significance:* I'm the only one who is interested in it or knows anything about it.
17. *I wish to thank Miss Sheehan for her patience and excellent typing:* She has threatened never to type another word unless I put this in.
18. *I wish to thank Dr. Seda for some valuable suggestions:* All the ideas and work are due to Dr. Seda, my supervisor.
19. *It is natural to ask the question:* One of my research students just has.
20. *We are sorry that due to lack of space we cannot publish your article:* Some people have a neck sending such rubbish

to a distinguished journal like ours.

21. *Some of his results are in conflict with ours:* The guy's crazy.  $SL(2,p)$  is an obvious counterexample.
22. *Dr. Fitzpatrick has kindly pointed out an error in Lemma 3:* Why doesn't that \*\*\*\*\* mind his own business.
23. *I wish to thank my supervisor for his valuable assistance in the preparation of this paper:* I saw him once in the distance at a conference.

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