
Problem of the Week

Solution to Problem Four

Which of the following statements is/are true?

1. At least one of these statements is false.
2. At least two of these statements are false.
3. At least three of these statements are false.
4. At least four of these statements are false.
5. At least five of these statements are false.
6. At least six of these statements are false.
7. At least seven of these statements are false.
8. At least eight of these statements are false.

SOLUTION: Suppose that exactly x of the statements are false. Considering what the statements actually assert, it would have to be that the first x statements are true, while the remaining $8 - x$ statements are false. This is possible only if $x = 8 - x$, which implies that $x = 4$. So there are four true statements and four false statements. This, in turn, is possible only if it is the first four statements that are true, and the last four which are false.