"You Want Me to Show You My Math?"
(Dr. Rick Sanchez, our colleague)

We expect the game field of the Minesweeper Intermediate level to have usual width and length equal to 16 cells. The number of mines is 40.
So, based on combinatorics, we get

$$N = \binom{40}{16^2} = \frac{256!}{40! \cdot (256-40)!} = \frac{217 \cdot 218 \cdot \ldots \cdot 256}{1 \cdot 2 \cdot \ldots \cdot 40} \approx 1.0492 \cdot 10^{47}$$

variants to place mines in the field, where $\binom{n}{m}$ is the binomial coefficient.
Of this large amount, only M = 344 are the mines that:

1) are distributed symmetrically to the field center,
2) are located axially symmetrically in each quarter (symmetry of the second order),
3) meet the condition of one-click win.

All these distributions can derive from the graph theory. But you can still apply brute force and iterate all variants – their number is disproportionately less than the number above, only

$$\binom{10}{8^2} = \frac{64!}{10! \cdot (64-10)!} = \frac{55 \cdot 56 \cdot \ldots \cdot 64}{1 \cdot 2 \cdot \ldots \cdot 10} \approx 1.5147 \cdot 10^{11}$$

for the first condition and

$$\binom{5}{4 \cdot 8} = \frac{32!}{5! \cdot (32-5)!} = \frac{55 \cdot 56 \cdot \ldots \cdot 64}{1 \cdot 2 \cdot \ldots \cdot 10} = 201376$$

for the first two conditions.

To meet the third condition, you need to check each variant for compliance with one-click win.

The chance to meet such a game is equal to

$$\frac{M}{N} \approx 3.2787 \cdot 10^{-45},$$

only one game in 305 tredecillions (10^{42}) will meet all these conditions. Just imagine, how pretty darn lucky you should be to see that!

Do you want to see the proof based on the graph theory? Cuius rei demonstrationem mirabilem sane detexi. Hanc marginis exiguitas non caperet (I have discovered a perfectly marvelous proof, but this margin is not big enough to hold it). 😊

Sincerely,
Your Prof.