The mathematics of losing: what the Superenalotto numbers really tell you

Francesco Barbato · Full Stack · Cybersecurity · AI

Published 9 March 2026 · 7 min read

ABSTRACT

One ticket, six numbers, a 1-in-622-million shot. What are you actually buying when you play the Superenalotto? The numbers behind the numbers: combinations, prize tiers, expected value and where the money goes.

Keywords: Probability · Statistics · Combinatorics · Mathematics · Gambling

Every week, millions of Italians fill out a Superenalotto ticket and imagine what they would do with hundreds of millions of euros. The jackpot climbs. The adverts run. The dream is sold cheaply: one ticket costs €1. But what are you actually buying? This article does what the lottery company doesn't: it shows you the numbers behind the numbers.

1 How the draw works

The Superenalotto asks you to pick **6 numbers from 1 to 90**. During the draw, 6 numbers are extracted from the same range. To win the jackpot, called *Sei*, all 6 of your numbers must match the 6 drawn. Simple in concept. Catastrophic in probability.

There is also a **Jolly** number (a 7th ball drawn) that comes into play for the *Cinque+1* prize tier, and a **SuperStar** add-on you can pay extra for. We'll focus on the core game.

2 The combinatorics: how to count possibilities

The number of ways to choose 6 numbers from 90, without caring about order, is given by the binomial coefficient:

> FORMULA
>
> $C(90, 6) = 90! / (6! \times 84!) =$ **622,614,630**

That's over **622 million** distinct combinations. You buy one ticket: you cover exactly one of them. Your probability of winning the jackpot with a single ticket is therefore:

> **JACKPOT PROBABILITY**
>
> P(Sei) = 1 / 622,614,630 ~ **0.00000016%**

To give that number a physical sense: Rome to Milan is about 570 km, which is roughly 570 million millimetres of road. Winning the jackpot is about as likely as picking the right *millimetre* of that drive, blindfolded, on your first attempt.

3 All prize tiers, all probabilities

The Superenalotto has six prize tiers. Here is the complete breakdown, with the number of winning combinations for each:

Table 1. Prize tiers of the Superenalotto

Category	Match	Winning combinations	Probability (1 in ...)
Sei	6 of 6	1	622,614,630
Cinque+1	5 of 6 + Jolly	C(6,5) × 1 = 6	103,769,105
Cinque	5 of 6	C(6,5) × C(83,1) = 498	1,250,231
Quattro	4 of 6	C(6,4) × C(84,2) = 52,290	11,907
Tre	3 of 6	C(6,3) × C(84,3) = 1,905,680	327
Due	2 of 6	C(6,2) × C(84,4) = 28,942,515	21.5

The *Due* tier, matching just 2 numbers, pays a few euros and happens roughly once every 22 tickets. This is the lottery's psychological anchor: frequent tiny wins keep players engaged, while the profit hides in the gap between what prizes cost and what tickets earn. Prize amounts vary from draw to draw, so they are left out of the table.

4 Expected value: the maths of the bad deal

Expected value (EV) is the average amount you gain or lose per ticket over a large number of plays. It is calculated as:

> **EXPECTED VALUE**
>
> EV = Σ (prize × probability) − ticket cost

Let's work through the jackpot for a typical draw where it is €50,000,000, a mid-size jackpot by Superenalotto standards. Its contribution alone is:

JACKPOT CONTRIBUTION

50,000,000 × (1 / 622,614,630) ~ **€0.08**

Adding all the other tiers, a large share of each euro comes back as prizes: about 60 cents per euro on average, according to the breakdown reported by the press (see below). The rest goes to the state, the retailers and the operator. And that is before tax.

IMPORTANT CAVEAT

This assumes you receive the full prize. Italian lottery winnings above €500 are subject to a **20% withholding tax**, which lowers the real return. And when a jackpot grows very large and attracts tens of millions of tickets, the risk of sharing it with other winners rises sharply.

5 The "big jackpot" trap

You might think: if the jackpot is big enough, doesn't the expected value become positive? In theory, yes. In practice, there are two problems.

First, as jackpots grow, ticket sales surge. When hundreds of millions of tickets are sold, the probability of splitting the jackpot with another winner increases sharply. If you and one other winner split a €300,000,000 jackpot, each receives €150,000,000, halving the EV contribution before tax.

Second, the **marginal utility of money** is not linear. For almost every human being, the 300-millionth euro is worth far less subjectively than the first. An EV calculation that treats €622,614,630 as 622 million times better than €1 is mathematically accurate but psychologically irrelevant.

6 How unlikely is 1 in 622 million? Real comparisons

Abstract numbers are hard to feel. Here are some calibration points:

Table 2. Some calibration points

Event	Probability
Winning the Superenalotto jackpot	1 in 622,614,630
Being struck by lightning in a given year (order of magnitude)	about 1 in 1,000,000
Being dealt a royal flush in poker (first 5 cards)	1 in 649,740
Flipping heads 29 times in a row	1 in 536,870,912
Flipping heads 30 times in a row	1 in 1,073,741,824

You are roughly **600 times more likely** to be struck by lightning this year than to win the Superenalotto jackpot today. You are also more likely to flip a fair coin and get heads 29 times in a row.

7 The law of large numbers and the gambler's fallacy

Two cognitive errors drive lottery play. The first is the **gambler's fallacy**: believing that numbers which haven't appeared recently are "due". In a fair, independent draw, every combination has exactly the same probability on every draw. The balls have no memory. The number 47 does not know it hasn't appeared in six weeks.

The second error is **overweighting rare events**. Kahneman and Tversky's Prospect Theory shows that humans systematically overestimate the probability of very unlikely, very salient outcomes, exactly the profile of a lottery jackpot. The lottery industry is built, with mathematical precision, on this cognitive bias.

> **THE FALLACY IN NUMBERS**
>
> If you played one ticket per week for 10 years (520 tickets), your probability of winning the jackpot at least once would be 1 − (1 − 1/622,614,630)^520 ~ **0.000084%**. Still essentially zero.

8 Playing 10 numbers instead of 6: the combinatorial cost

Some players use "reduced systems", covering more numbers to increase their chances. If you play all the 6-number combinations of your chosen 10 numbers, you need C(10,6) = **210 tickets**, costing €210 per draw. Your probability of winning the jackpot becomes:

> **SYSTEM WITH 10 NUMBERS**
>
> P = 210 / 622,614,630 ~ 1 in 2,964,832

Still less than 1 in 2.9 million. You've spent 210 times more money to improve your odds 210 times, leaving the expected value per euro spent *identical*. The house edge does not change.

9 Where the money actually goes

For every €1 ticket sold in the Superenalotto, the allocation reported by the Italian press is approximately the following. The exact shares vary by year and by region, so read them as orders of magnitude:

Table 3. Allocation of each euro played

Destination	Approximate share
Prize pool (all tiers combined)	about 60%
Italian state (taxes)	about 28%
Retailer commission	about 8%
Operator (Sisal)	about 4%

The state is, by a large margin, the biggest beneficiary of every draw, whether or not anyone wins the jackpot. Lotteries are, in the precise economic sense, a **voluntary tax on mathematical optimism**.

10 Is there any rational reason to play?

Yes, but it's not mathematical. If a €1 ticket buys you a week of enjoyable daydreaming, and that subjective experience is worth €1 to you, then the purchase is rational in the same way a cinema ticket is rational: you're paying for an experience, not an investment return.

The mistake is not playing. The mistake is playing *believing* you have a realistic chance, playing with money you can't afford to lose, or using systems and frequency analyses to convince yourself you can outsmart a combinatorial problem with a fixed, known solution space.

> **KEY TAKEAWAY**
>
> The Superenalotto jackpot probability is 1 in 622,614,630. No strategy, system or frequency chart changes this. The expected value is negative by design. Play if you enjoy it. Don't play to win.

11 Conclusion

The Superenalotto is a beautifully engineered probability machine. The mathematics are elegant, the prize tiers are carefully calibrated to maximise engagement, and the business model is sound, for everyone except the players. Understanding the numbers doesn't make the lottery less entertaining. It makes you a more honest participant.

The next time someone tells you they have a “system”, you can now explain, with precision, why the only system that works belongs to the house.

All probability calculations in this article assume a fair, independent draw with 90 balls and no replacement. Prize amounts and the allocation of takings are approximate and may vary per draw and per year.

> **HOW TO CITE THIS ARTICLE**
>
> Francesco Barbato (2026). The mathematics of losing: what the Superenalotto numbers really tell you. localhost:3000.
>
> Online version: http://localhost:3000/en/blog/superenalotto-mathematics-probability