Powerball

PHP 2500 Introduction to Biostatistics
October 4, 2007

BROWN

POWERBALL
POWER PLAY

POWERBALL

Current Estimated Jackpot is...
$ 15 Million
$ 7 Million Cash Value

There was one winner in the state of Louisiana for the last drawing's $ 15,000,000 grand pri

Powerball Numbers
Winners' Stories
How to Play
Where to Play
Signup
Lottery Links
FAQ | History | News
About Us
Home

Play Responsibly
Press Contacts
Multi-State Lottery Association

Contact Us

Powerball - Prizes and Odds

Match	Prize	Odds
+	Grand Prize	1 in 146,107,962.00
+	$200,000	1 in 3,563,608.83
+	$10,000	1 in 584,431.85
+	$100	1 in 14,254.44
+	$100	1 in 11,927.18
+	$7	1 in 290.91
+	$7	1 in 745.45
+	$4	1 in 126.88
	$3	1 in 68.96

The overall odds of winning a prize are 1 in 36.61.
The odds presented here are based on a $1 play (rounded to two decimal places).
Why isn't the chance of winning $3 at 1 in 42? Click here for FAQ.

Combination	Prize	Odds
+	Grand Prize	1 in 146,107,962.00
+	$200,000	1 in 3,563,608.83
+	$10,000	1 in 584,431.85
+	$100	1 in 14,254.44
+	$100	1 in 11,927.18
+	$7	1 in 290.91
+	$7	1 in 745.45
+	$4	1 in 126.88
	$3	1 in 68.96

The overall odds of winning a prize are 1 in 36.60. The odds presented here are based on a $1 play and are rounded to two decimal places

Calculating the Odds

- Probability distribution is Hypergeometric
  - 55 white balls to choose from
  - You select 5 white balls without replacement
  - Lottery chooses 5 winning white balls (hopefully this matches the 5 you chose!)
  - Red ball is the power ball (42 different numbers!)
- Jackpot requires matching all 5 white balls and the red ball

Calculating the Odds

- 55 white balls of which 5 are the winning balls
- You select 5 balls, of which all 5 must be winning

$$P(\text{5 white and 1 red}) = P(\text{5 white})P(\text{red})$$

$$= \frac{1}{\binom{55}{5}}\frac{1}{\binom{42}{1}} = \frac{1}{3{,}478{,}761(42)}$$

$$= \frac{1}{146{,}107{,}962}$$

Calculating the Odds

$$P(\text{5 white and not red}) = P(\text{5 white})P(\text{not red})$$

$$= \frac{1}{\binom{55}{5}}\left(\frac{41}{42}\right) = \frac{41}{3{,}478{,}761(42)}$$

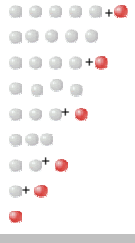
$$= \frac{1}{3{,}563{,}608.8}$$

Calculating the Odds

$$P(\text{3 white and not red}) = P(\text{3 white})P(\text{not red})$$

$$= \frac{\binom{5}{3}\binom{50}{2}}{\binom{55}{5}}\left(\frac{41}{42}\right)$$

$$= \frac{1}{290.91}$$

Combination	Prize	Odds
	Grand Prize	1 in 146,107,962.00
	$200,000	1 in 3,563,608.83
	$10,000	1 in 584,431.85
	$100	1 in 14,254.44
	$100	1 in 11,927.18
	$7	1 in 290.91
	$7	1 in 745.45
	$4	1 in 126.88
	$3	1 in 68.96

The overall odds of winning a prize are 1 in 36.60. The odds presented here are based on a $1 play and are rounded to two decimal places

Should you play?

- Grand prize wins 1 in 146,107,962 combinations
- Break even (fair game) if jackpot is $146,107,962
- If you purchased a ticket each second then
  - 60 tickets in a minute
  - 3,600 tickets in an hour
  - 86,400 tickets a day
  - 604,800 tickets a week
  - 2,419,400 tickets a month
  - 31,449,600 tickets a year
  - …Impossible to buy enough tickets to guarantee a win!

Should you play?

- Grand prize wins 1 in 146,107,962 combinations
- Break even (fair game) if jackpot is $146,107,962 and you get the whole jackpot!!!
- If you take the ½ now option, then you get only ½ the jackpot and then 40% goes to taxes.
- So, in this case, you need the jackpot to be $730,500,000 in order for the game to be fair!