

1. How many outcomes of breakfast are there?

27

2. What is the probability of getting poached Eggs?

NOT
 $\frac{5}{27}$

22%

3. What is the probability of getting poached eggs, bacon and white toast?

NOT
 $\frac{1}{27}$

22% 75% 17%

MULTIPLY

$(.22)(.75)(.17) = .028 = 2.8\%$

CHANGE PERCENTS INTO DECIMAL FORM

4. What is the probability of getting scrambled eggs, ham and any bread?

36% 15% 100%

$(.36)(.15)(1) = .054 = 5.4\%$

5. What is the probability of NOT getting a sandwich with fried eggs, ham, and Italian together?

PROBABILITY OF NOT GETTING IT

42% 15% 60%

$100\% - 3.8\% = 96.2\%$

$(.42)(.15)(.60) = .0378 = 3.8\%$

PROB OF GETTING IT

6. What is the probability that you will get sausage or ham?

10% + 15%

25%

7. What is the probability of not getting poached eggs?

22%

NOT

$100\% - 22\% = 78\%$

Combination	Prize	Odds
Match 5 + Powerball	\$186,000,000 (jackpot)	1 in 292,201,338
Match 5	\$1,000,000	1 in 11,688,054
Match 4 + Powerball	\$50,000	1 in 913,129
Match 4	\$100	1 in 36,525
Match 3 + Powerball	\$100	1 in 14,494
Match 3	\$7	1 in 580
Match 2 + Powerball	\$7	1 in 701
Match 1 + Powerball	\$4	1 in 92
Just <u>powerball</u>	\$4	1 in 28

Assume you are going to play the lottery for an entire year. The drawings for powerball are twice a week which means you can play 104 times a year. Each play costs \$2. What do you predict to be your expected value or in other words how much you expect to win over the year?

$\$43$ $\$188$ $\$64$ $- 208$
 $\$208$ $\$1,249$ $\$64,896$



To find the Expected value of an event:

STEP ONE: (CASH PAYOUT of event 1)x(PROBABILITY of event 1) + (CASH PAYOUT of event 2)x(PROBABILITY of event 2) + ... continue until all events are accounted for. You add all the events together because those are ALL possible outcomes. This will give you the expected value (expected winnings) of one play (or of one ticket)



STEP TWO: You had to 'pay to play', that means you need to SUBTRACT the cost of the event. In powerball every play costs \$2, so subtract \$2 from your expected winnings

STEP THREE: If you want to find the value of **MULTIPLE PLAYS**, multiply your answer by the number of times you plan to play (so if you plan on buying 5 lottery tickets multiply by 5)

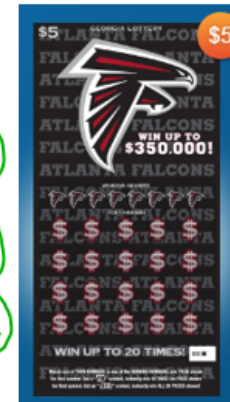
1. Find the expected value of one ticket in powerball

\$47	1 in 8,000
\$77	1 in 24,000

\$5 ticket "Atlanta Falcons"

To win- Match any of your numbers to any of the winning numbers and win the prize shown on that number.

3. Find the expected value of playing the \$5 shimmering cash



Prize	Odds
Free ticket (\$5)	1 in 10
\$5	1 in 60
\$8	1 in 60
\$10	1 in 20
\$15	1 in 60
\$20	1 in 24
\$25	1 in 207
\$30	1 in 234
\$40	1 in 572
\$50	1 in 375
\$75	1 in 500
\$100	1 in 288
\$200	1 in 9,231
\$600	1 in 60,000
\$10,000	1 in 540,000
\$350,000	1 in 1,350,000

FALCONS

$$\begin{aligned}
 & \$5\left(\frac{1}{10}\right) + \$5\left(\frac{1}{60}\right) + \$8\left(\frac{1}{60}\right) \\
 & + \$10\left(\frac{1}{20}\right) + \$15\left(\frac{1}{60}\right) + \$20\left(\frac{1}{24}\right) \\
 & + \$25\left(\frac{1}{207}\right) + \$30\left(\frac{1}{234}\right) + \$40\left(\frac{1}{572}\right) \\
 & + \$50\left(\frac{1}{375}\right) + \$75\left(\frac{1}{500}\right) + \\
 & + \$100\left(\frac{1}{288}\right) + \$200\left(\frac{1}{9,231}\right) + \$600\left(\frac{1}{60,000}\right) \\
 & + \$10,000\left(\frac{1}{540,000}\right) + \$350,000\left(\frac{1}{1,350,000}\right) \\
 & .50 + .08 + .13 + .50 + .25 + .83 \\
 & + .12 + .13 + .07 + .13 + .15 + .36 + \\
 & .02 + .01 + .02 + .26 = \underline{\underline{\$3.56}} \\
 & \text{EXPECTED WINNINGS}
 \end{aligned}$$

$$\$3.56 - \$5 = \text{\textcircled{\$-1.44}} \leftarrow \text{EXPECTED VALUE PAID}$$