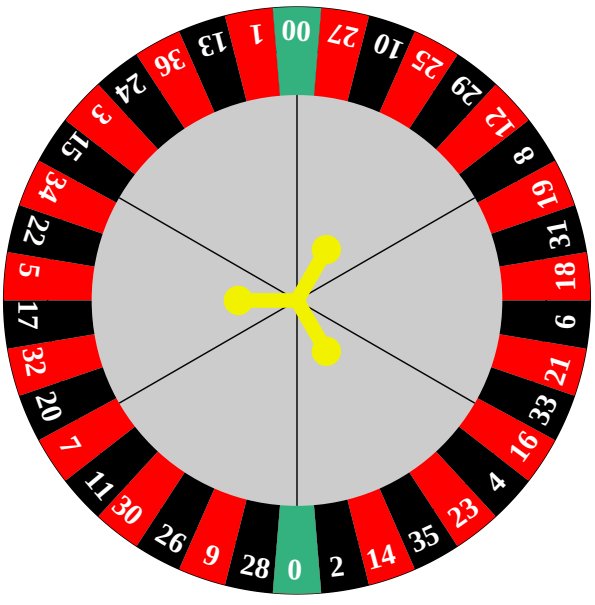
Roulette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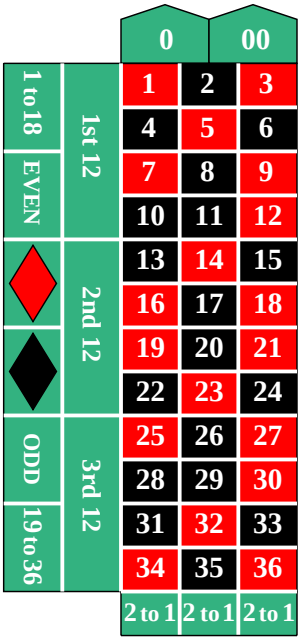
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ODD
3rd 12
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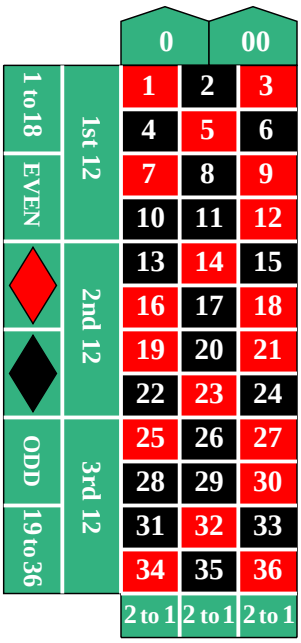
31 32 33
34 35 36
2 to 1
2 to 1
2 to 1

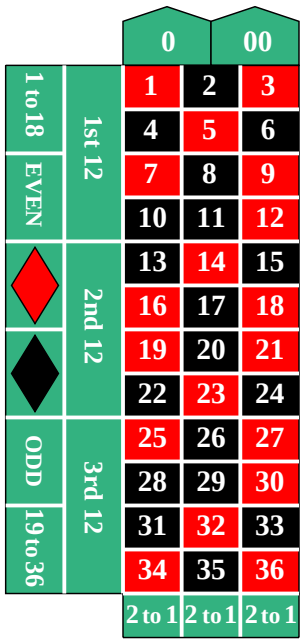
Roulette

Roulette Table



Roulette

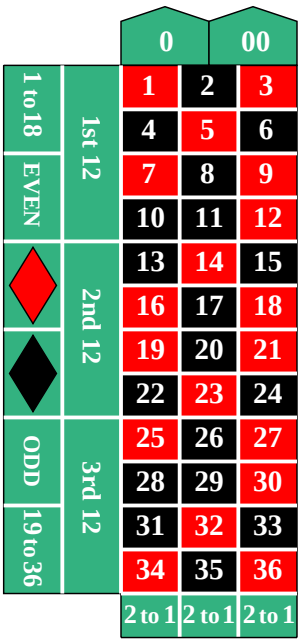
The probabilities of each space on the table =



Roulette

The probabilities of each space on the table =

$$\frac{\text{The number of winning outcomes}}{\text{The total number of possible outcomes}}$$



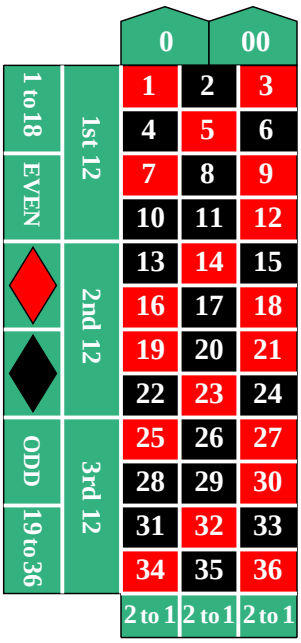
Roulette

The probabilities of each space on the table =

$$\frac{\text{The number of winning outcomes}}{\text{The total number of possible outcomes}} =$$

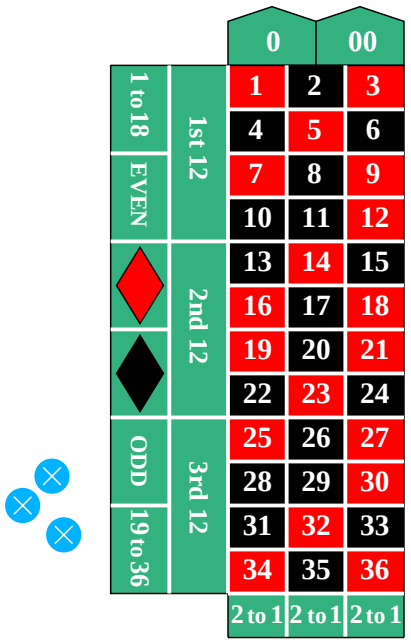
Roulette

Let’s try some examples...



Roulette

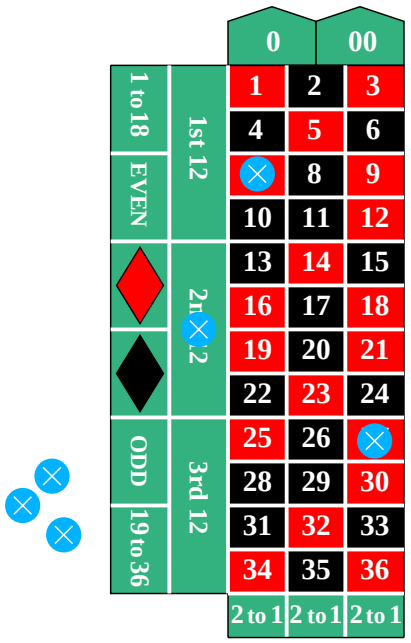
Example #1



Roulette

Example #1

If you place your bets as shown, what are your chances of winning?

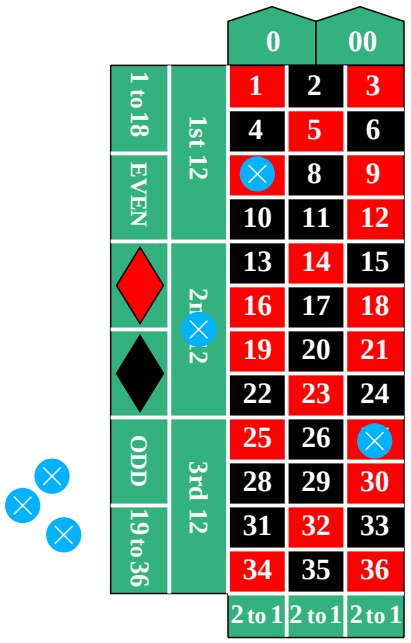


Roulette

Example #1

If you place your bets as shown, what are your chances of winning?

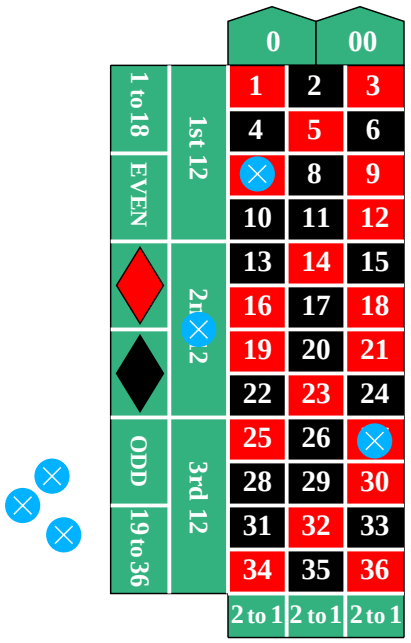
Answer:



Roulette

Example #1

If you place your bets as shown, what are your chances of winning?



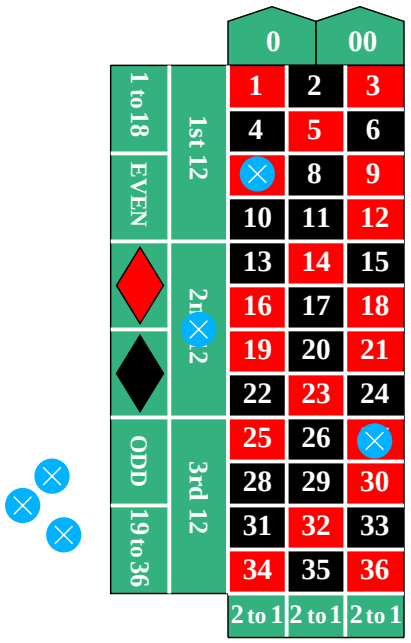
Answer:

P(7) + P(27) + P(13 thru 24)

Roulette

Example #1

If you place your bets as shown, what are your chances of winning?



Answer:

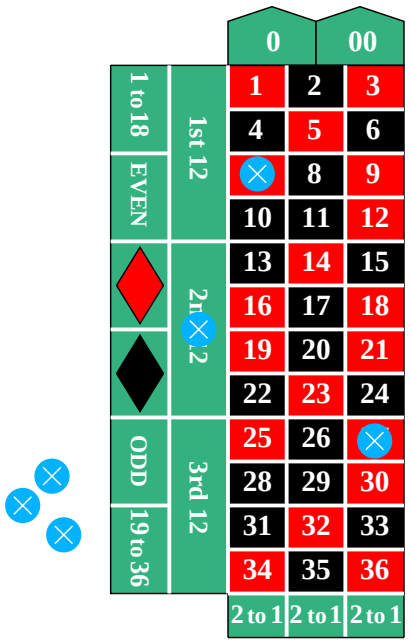
$$P(7) + P(27) + P(13 \text{ thru } 24)$$

$$= \frac{1}{38} + \frac{1}{38} + \frac{6}{19}$$

Roulette

Example #1

If you place your bets as shown, what are your chances of winning?



Answer:

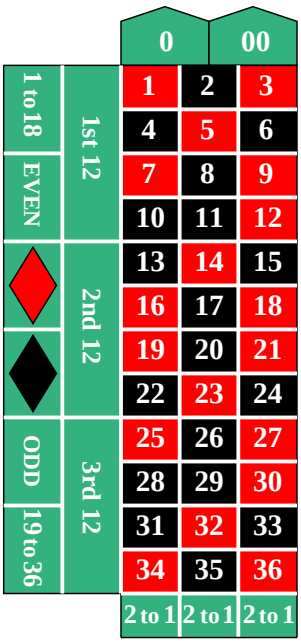
$$P(7) + P(27) + P(13 \text{ thru } 24)$$

$$= \frac{1}{38} + \frac{1}{38} + \frac{6}{19}$$

$$= \frac{7}{19}$$

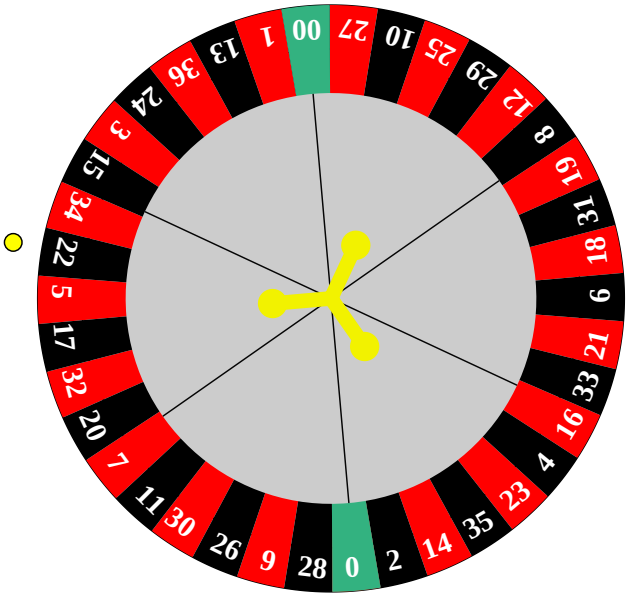
Roulette

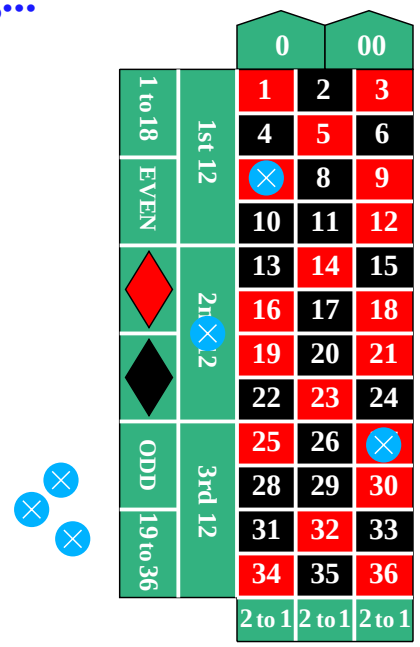
Here's a simulation of the previous example...



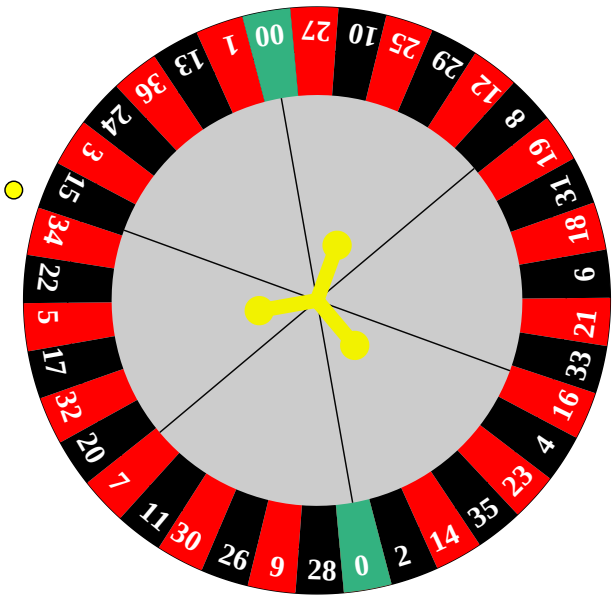
Roulette

The wheel will now start spinning...





Roulette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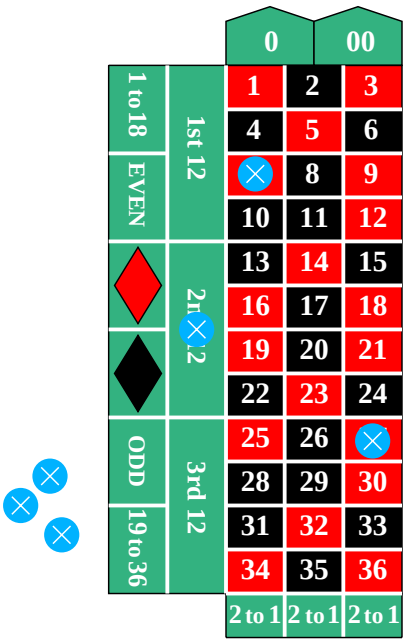
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2 to 1
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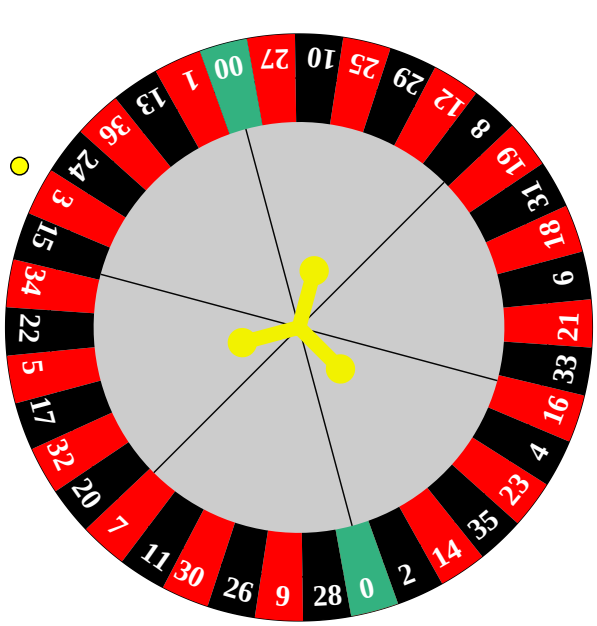
2 to 1

Roulette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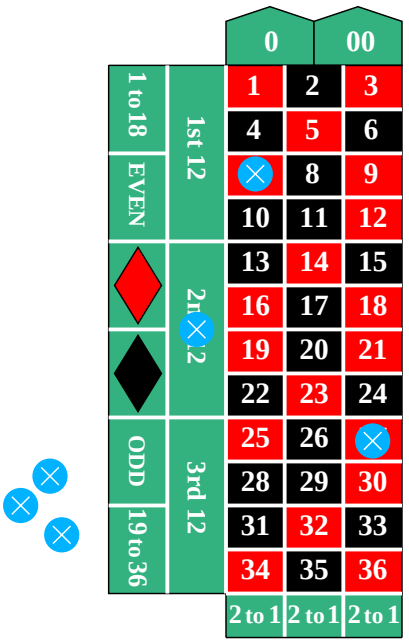
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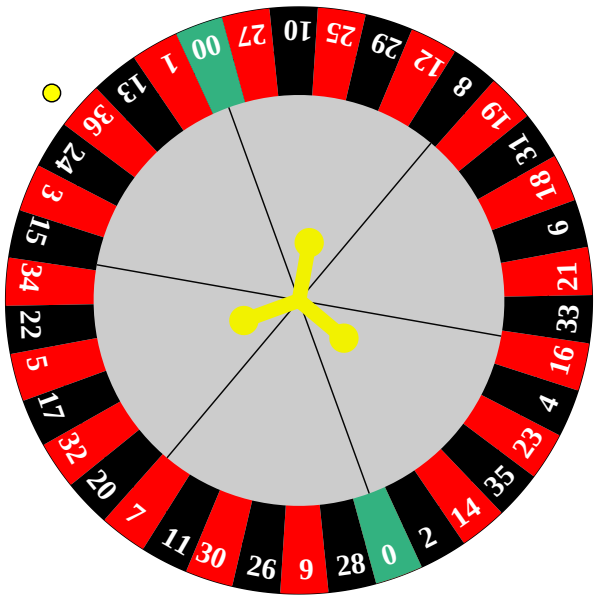
Roulette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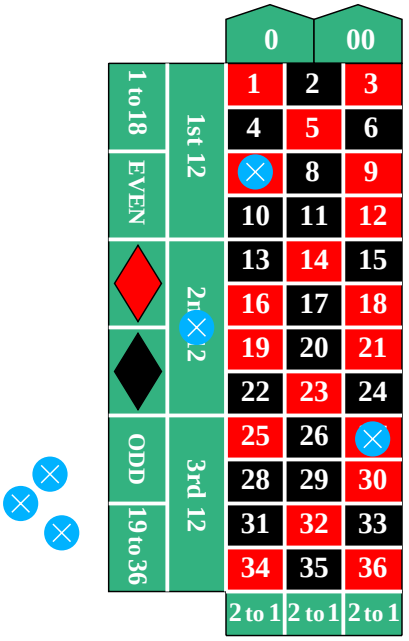
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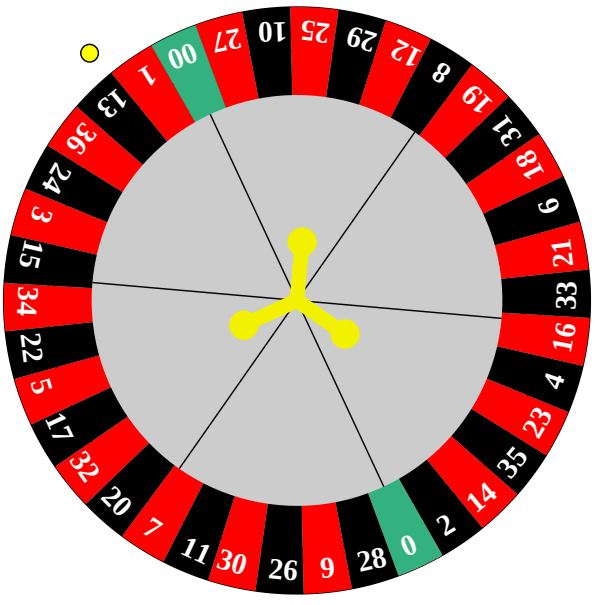
Roulette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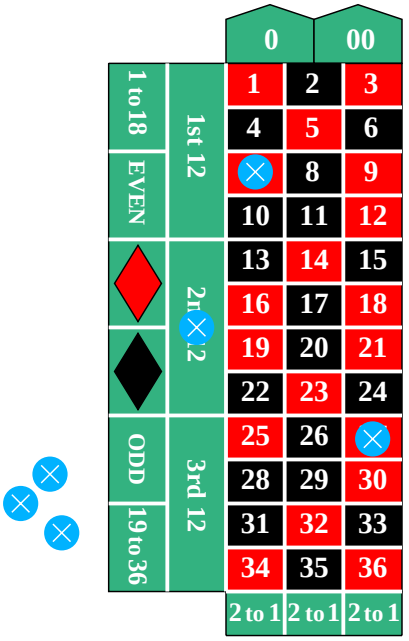
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34 35 36
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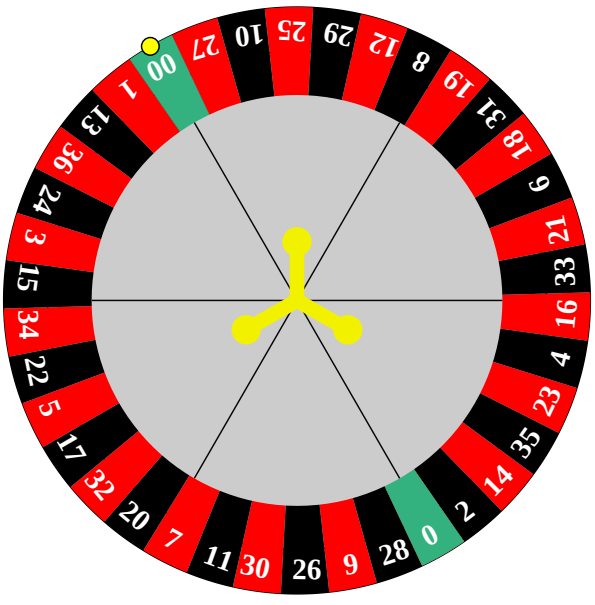
Roulette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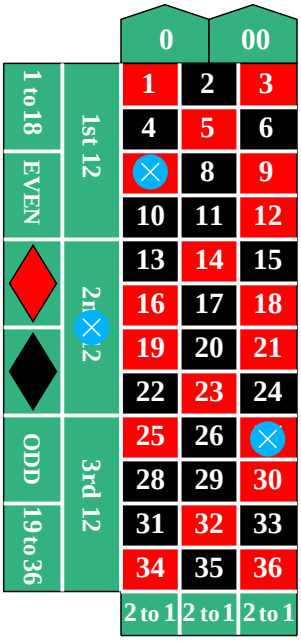
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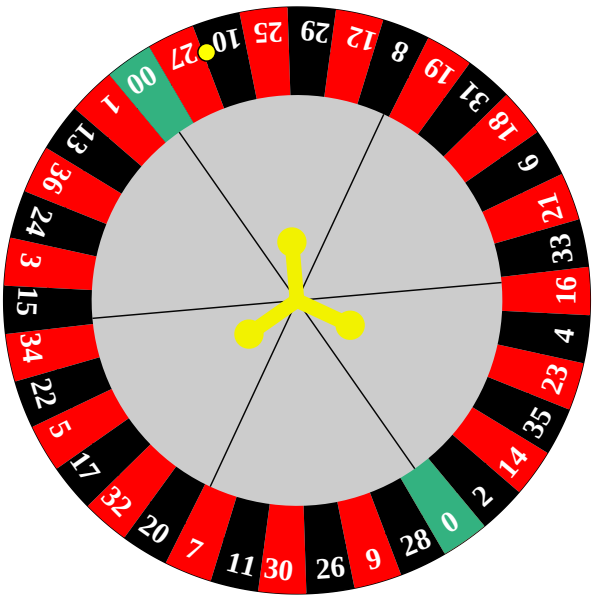
Roulette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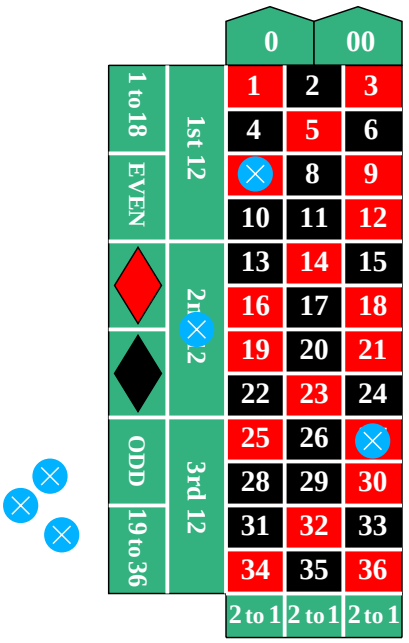
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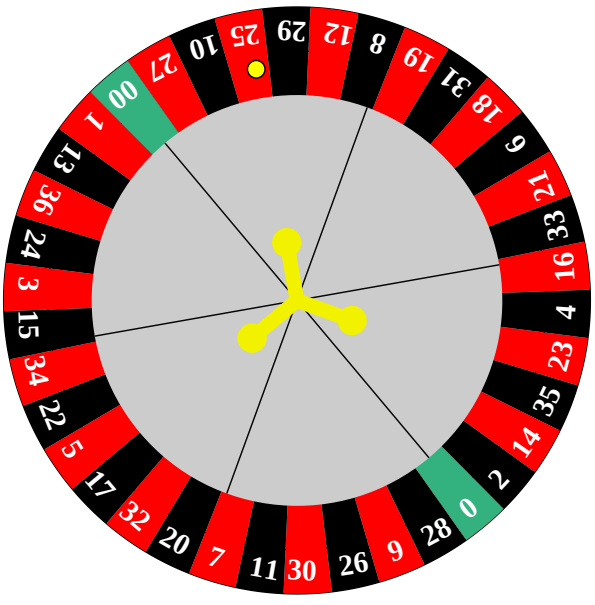
Roulette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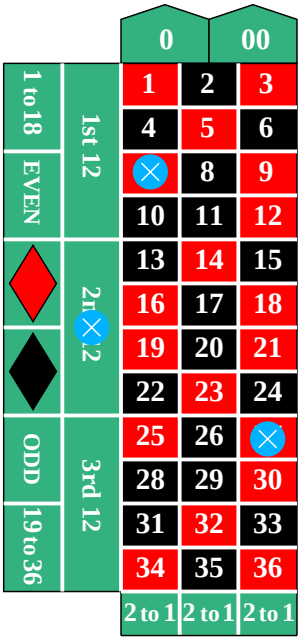
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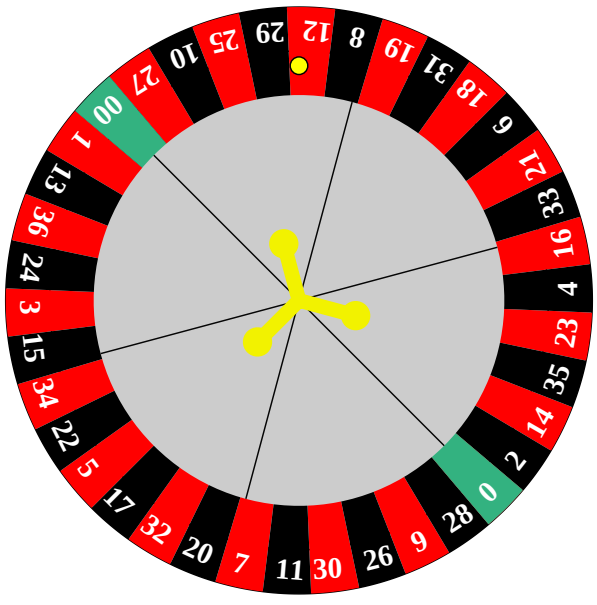
Roulette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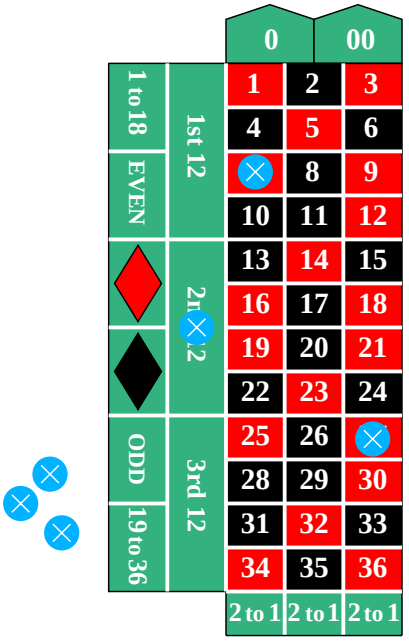
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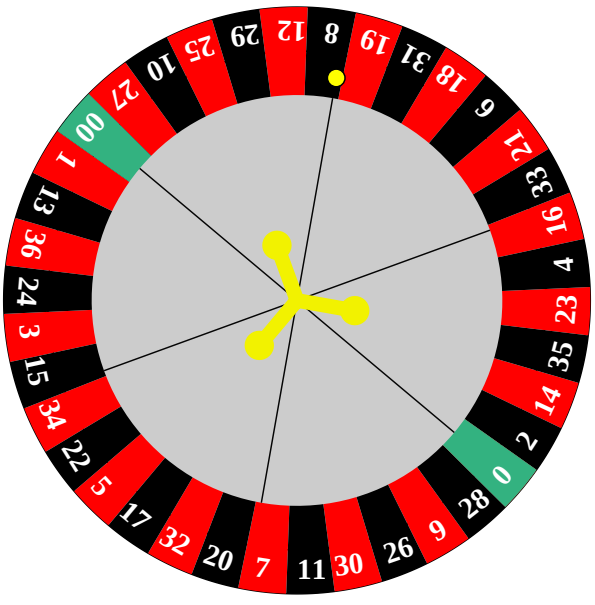
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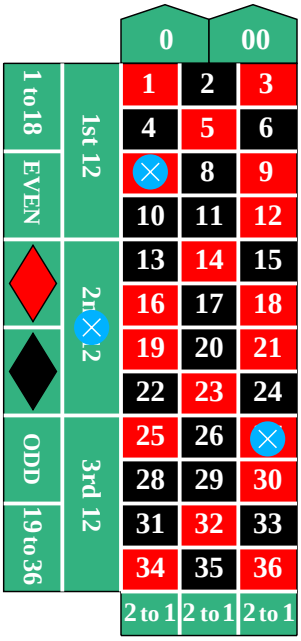
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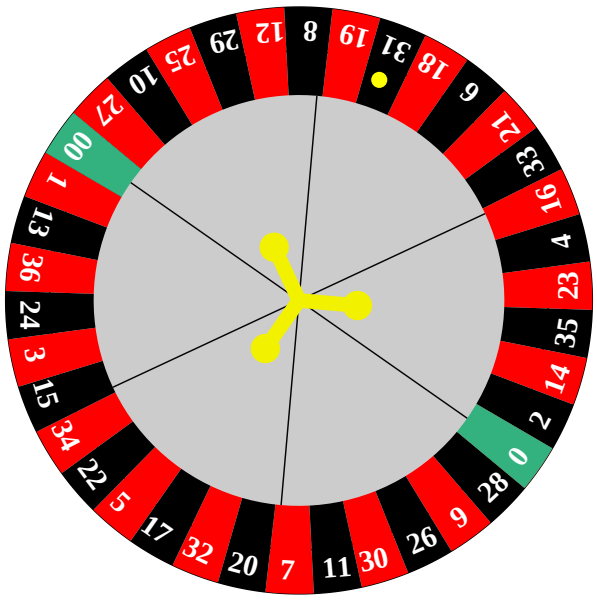
Roulette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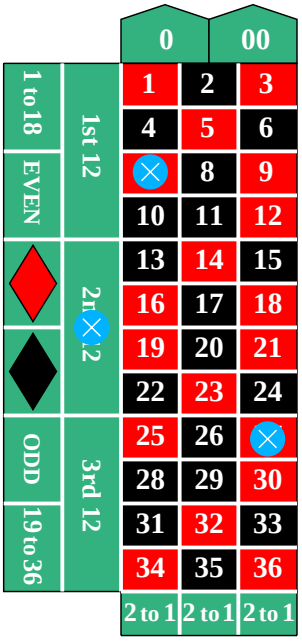
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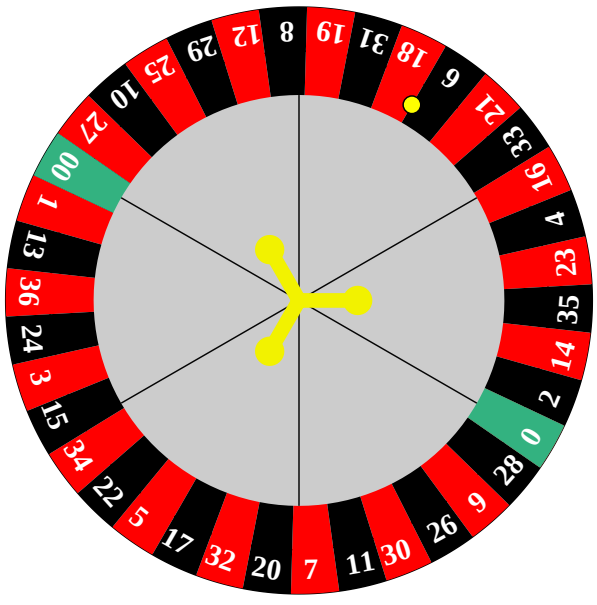
Roulette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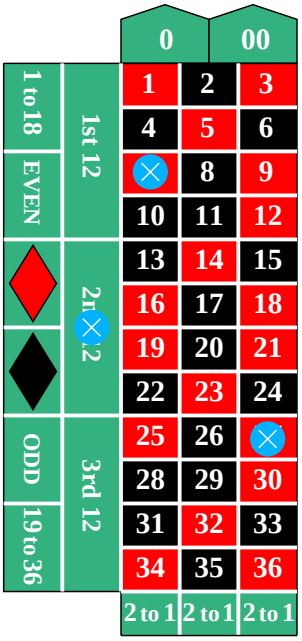
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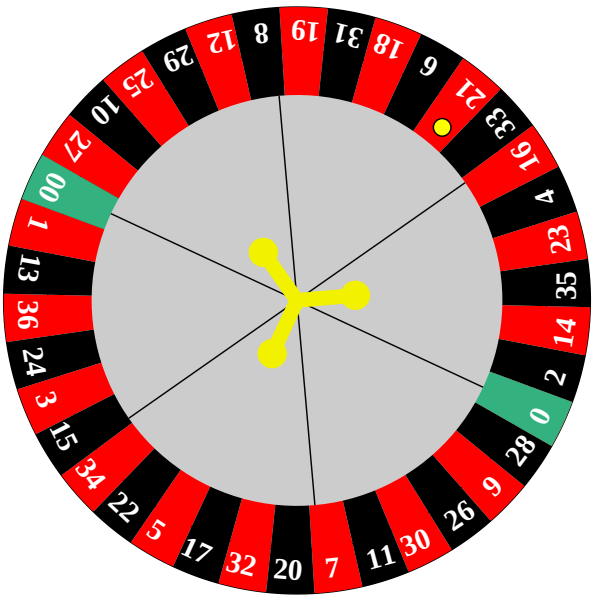
Roulette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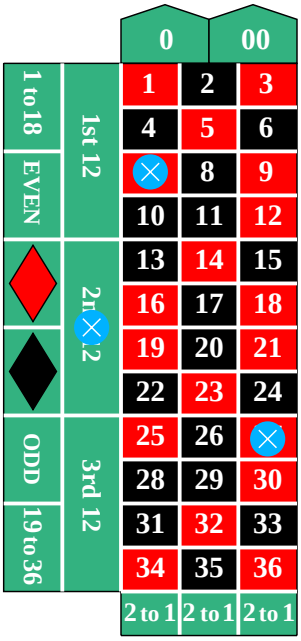
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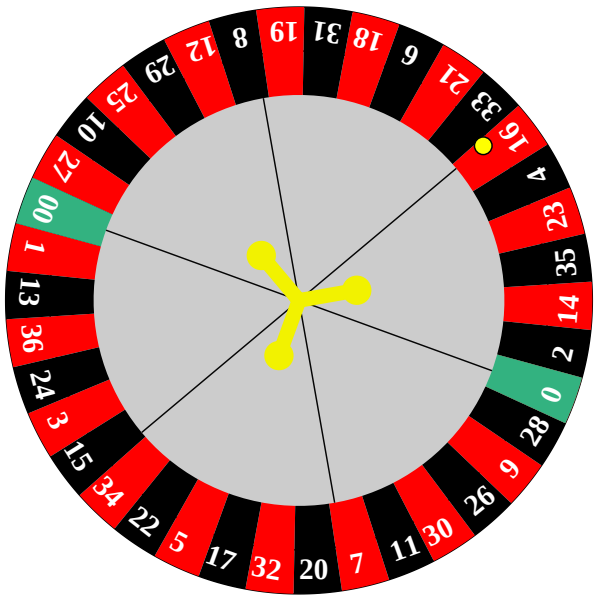
Roulette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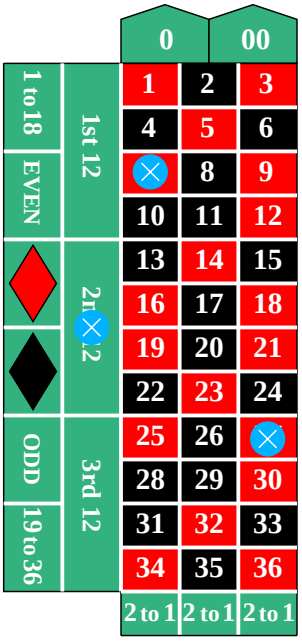
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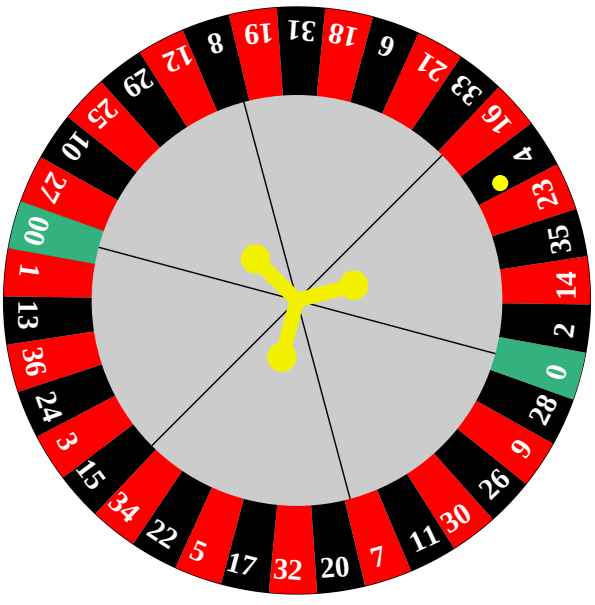
Roulette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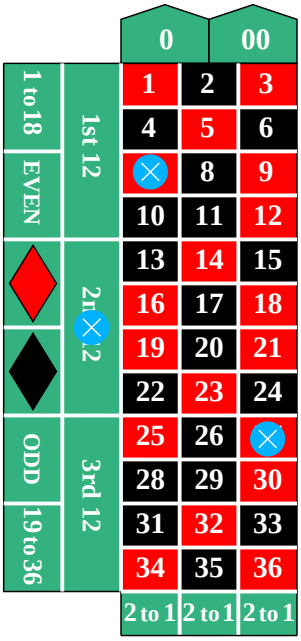
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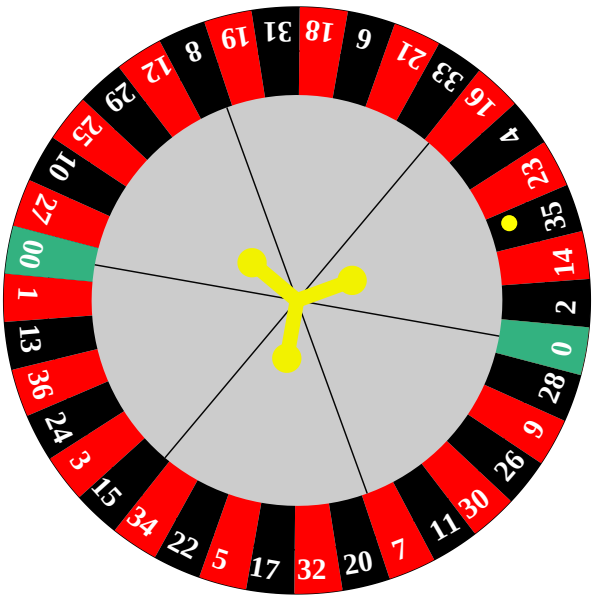
Roulette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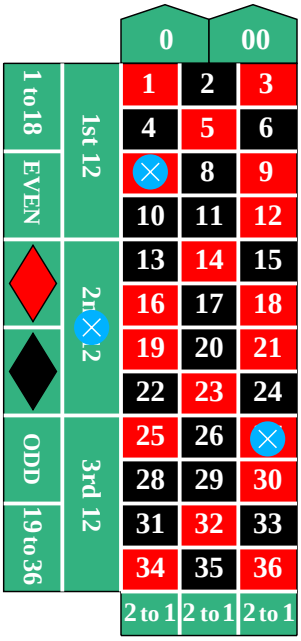
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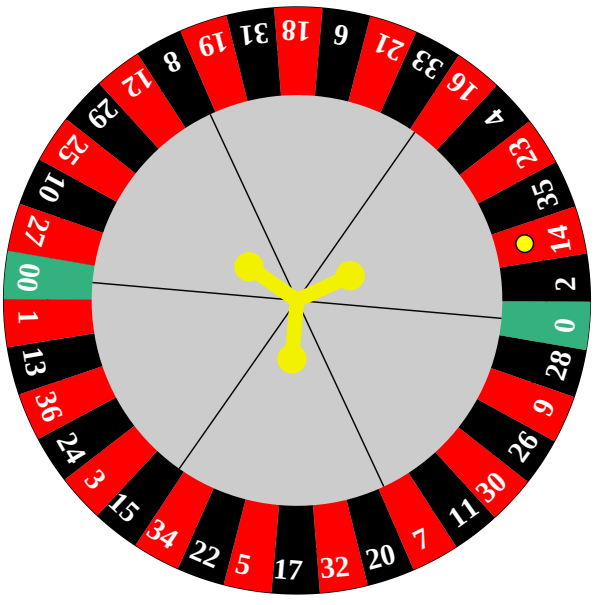
Roulette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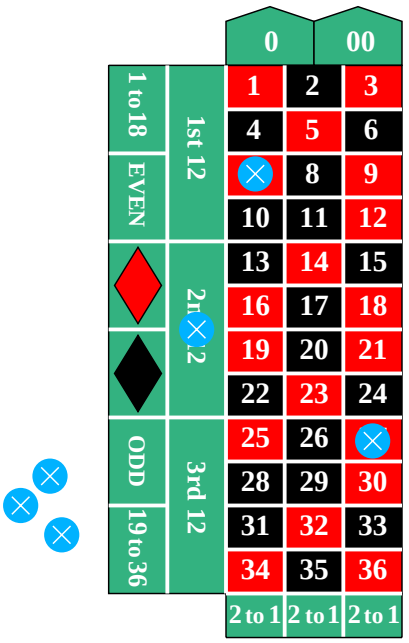
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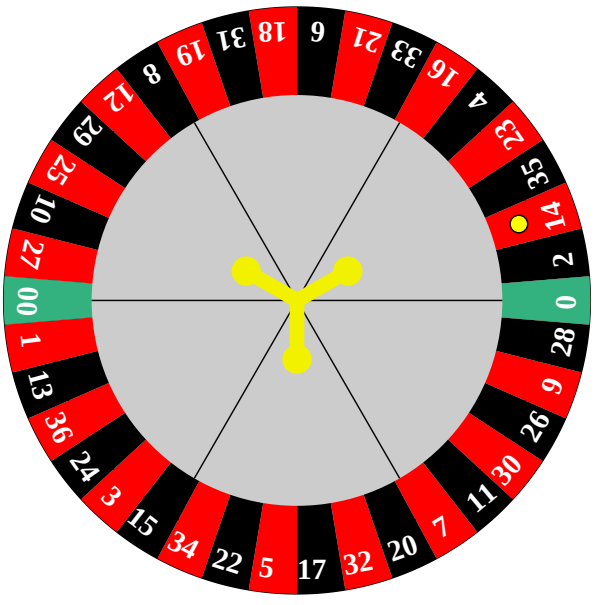
Roulette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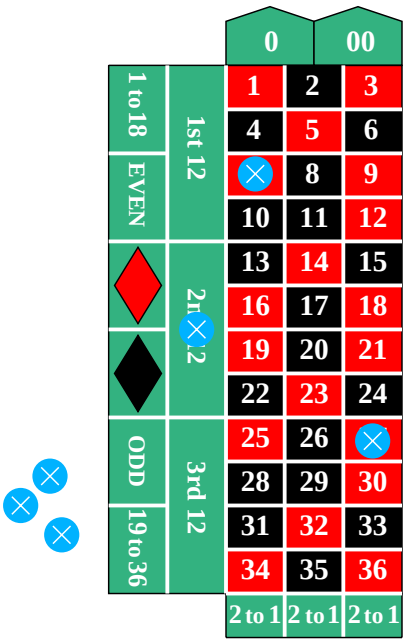
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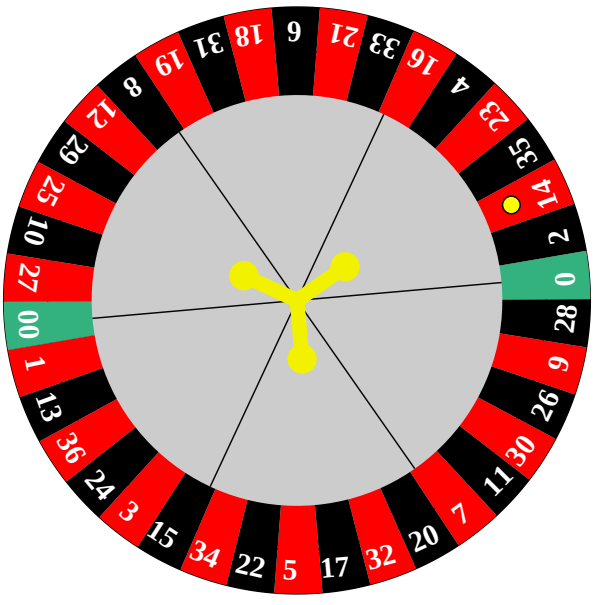
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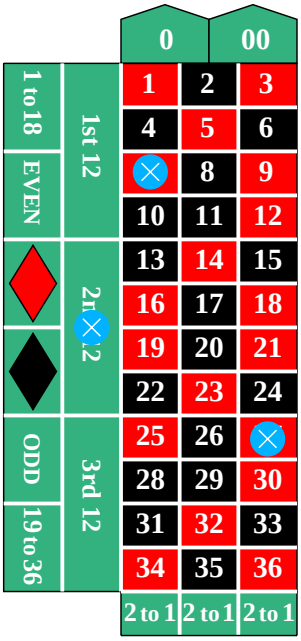
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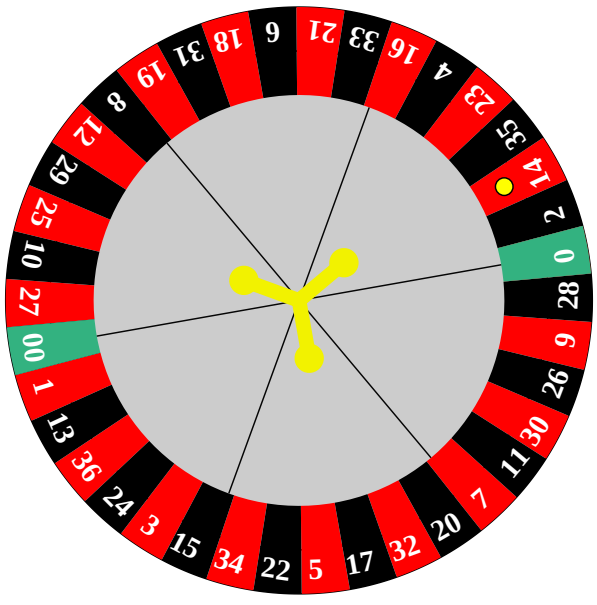
Roulette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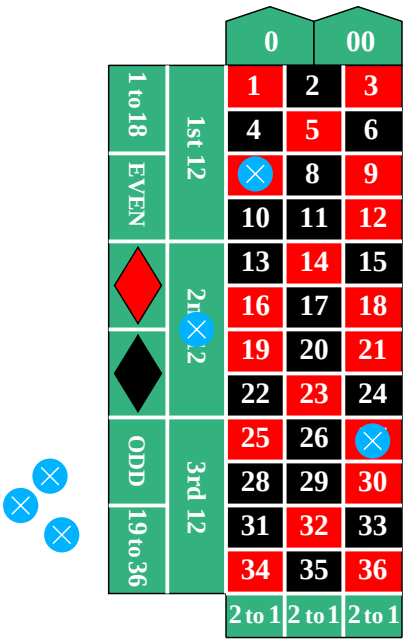
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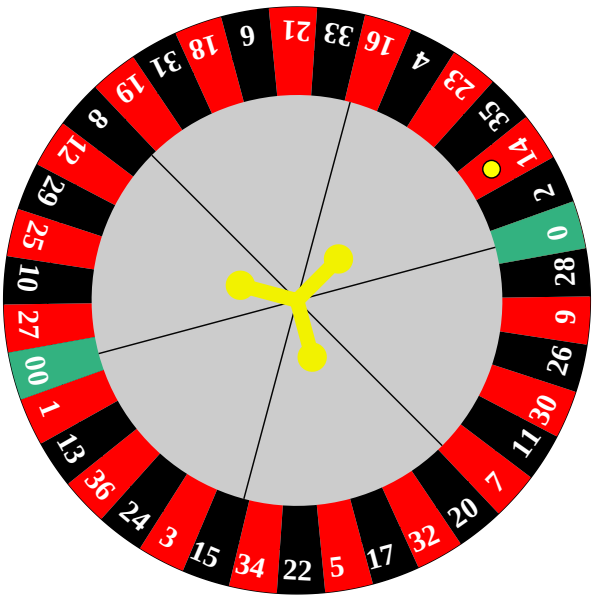
Roulette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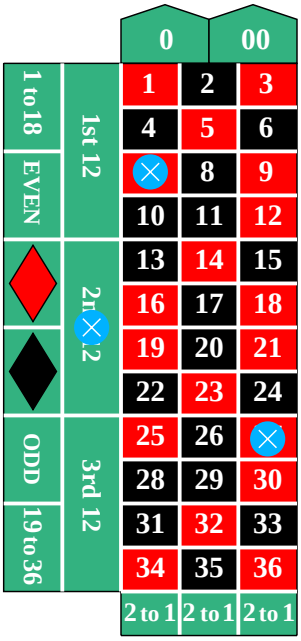
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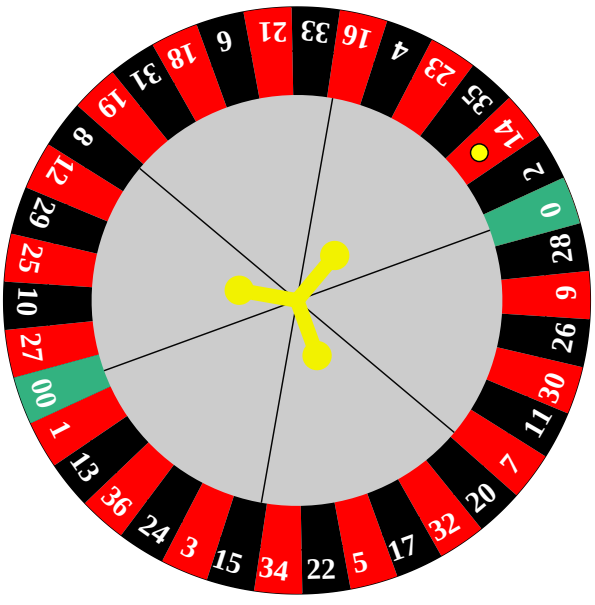
Roulette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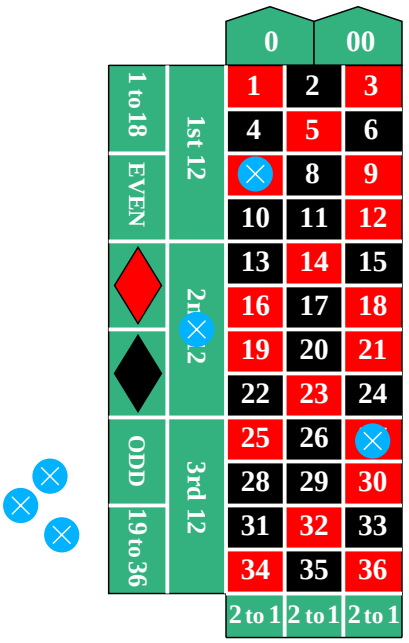
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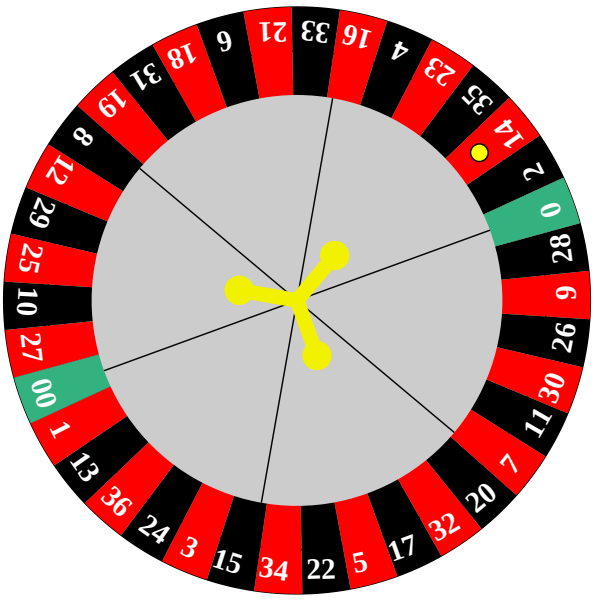
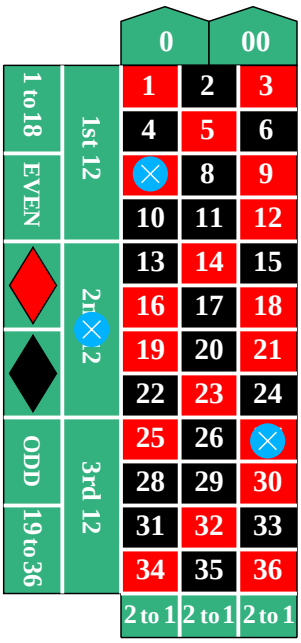
Roulette

14 wins!

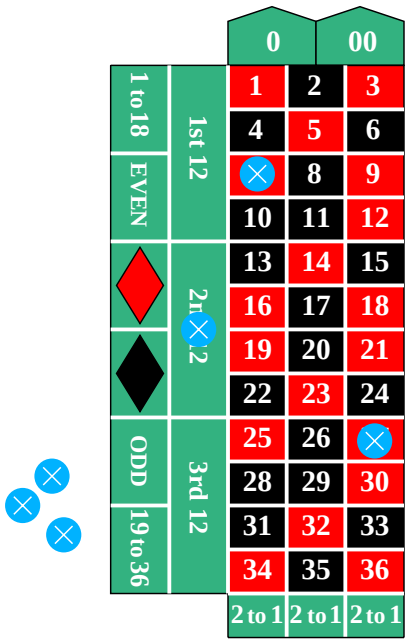




Roulette

14 wins!

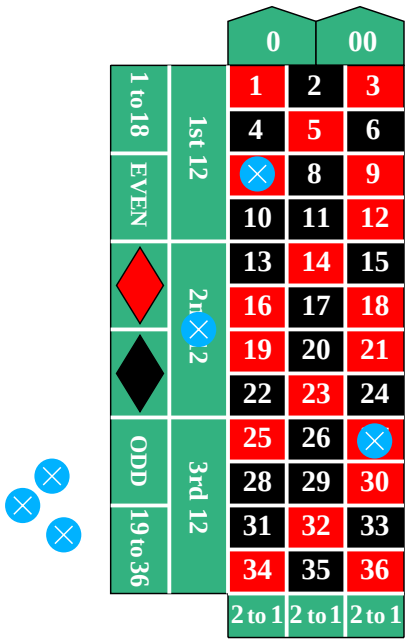
Therefore, you win because you bet on "2nd 12".



Roulette

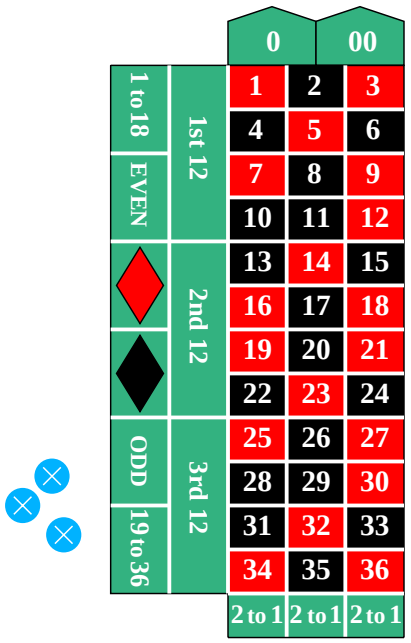
Example #1

**Since your bet was one chip,
the payout is 3 times your bet.
So, the payout is 2 chips plus
the 1 winning chip on the table.**



Roulette

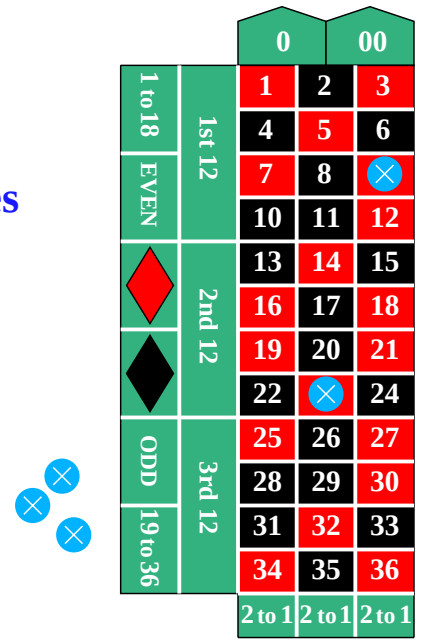
Example #2



Roulette

Example #2

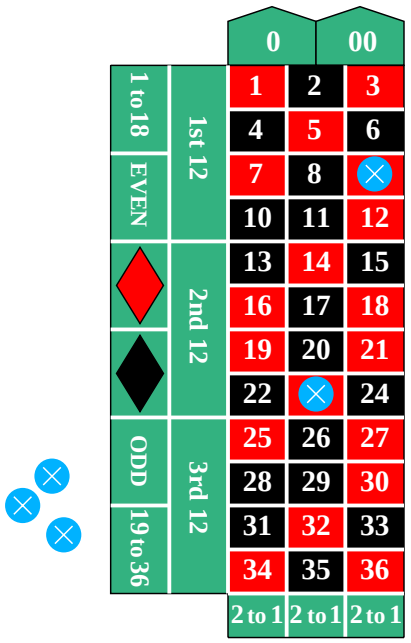
If the number has already been drawn and you can see that it's a red number. What are your chances of winning if your bets are placed as such, given that you know it's red?



Roulette

Example #2

Answer:

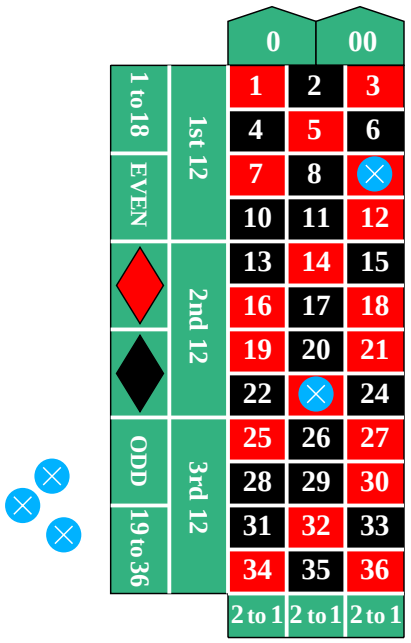


Roulette

Example #2

Answer:

P(9 or 23) =

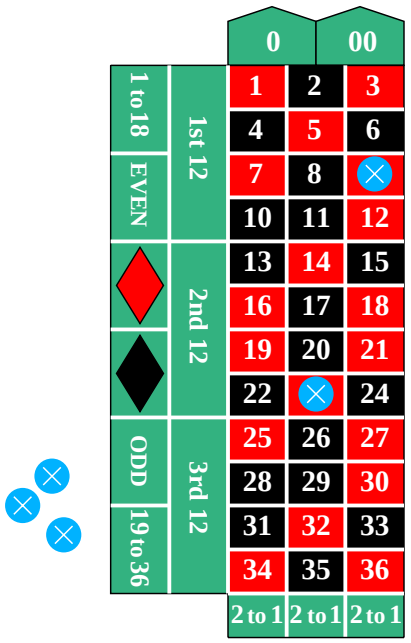


Roulette

Example #2

Answer:

P(9 or 23) = $\frac{1}{38} + \frac{1}{38} =$

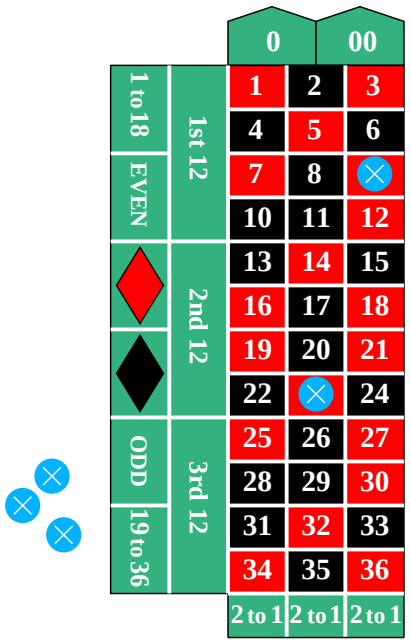


Roulette

Example #2

Answer:

$$P(9 \text{ or } 23) = \frac{1}{38} + \frac{1}{38} = \frac{1}{19}$$



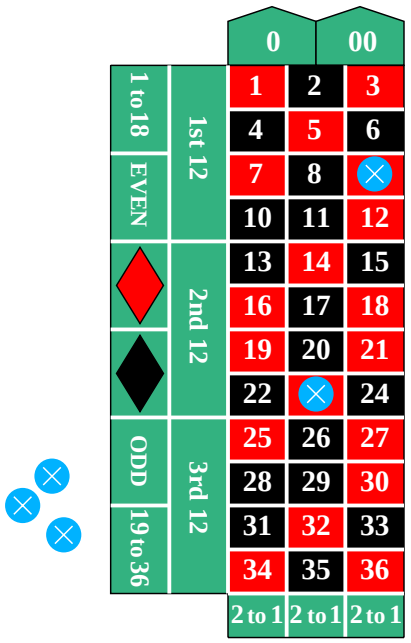
Roulette

Example #2

Answer:

P(9 or 23) = $\frac{1}{38} + \frac{1}{38} = \frac{1}{19}$

P(Red) =



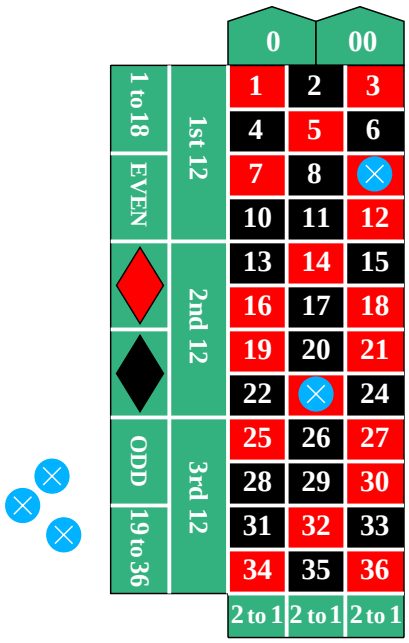
Roulette

Example #2

Answer:

$$P(9 \text{ or } 23) = \frac{1}{38} + \frac{1}{38} = \frac{1}{19}$$

$$P(\text{Red}) = \frac{9}{19}$$



Roulette

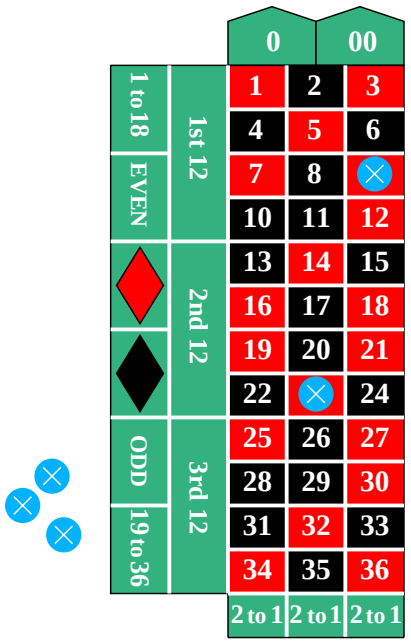
Example #2

Answer:

$$P(9 \text{ or } 23) = \frac{1}{38} + \frac{1}{38} = \frac{1}{19}$$

$$P(\text{Red}) = \frac{9}{19}$$

$$P(9 \text{ or } 23 \mid \text{Red}) =$$



Roulette

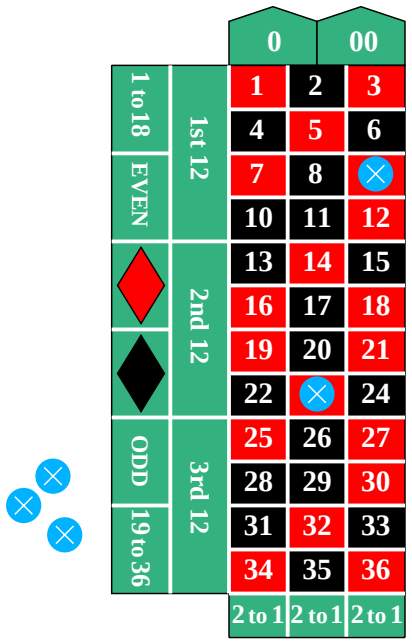
Example #2

Answer:

$$P(9 \text{ or } 23) = \frac{1}{38} + \frac{1}{38} = \frac{1}{19}$$

$$P(\text{Red}) = \frac{9}{19}$$

$$P(9 \text{ or } 23 \mid \text{Red}) = \frac{P(9 \text{ or } 23 \cap \text{Red})}{P(\text{Red})}$$



Roulette

Example #2

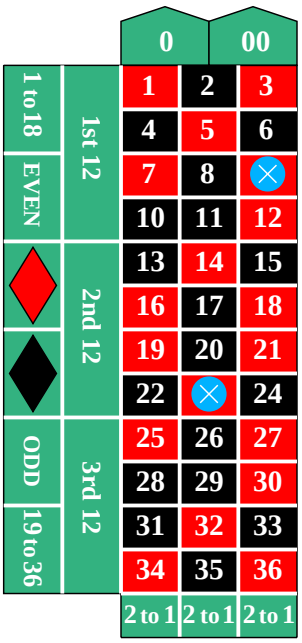
Answer:

$$P(9 \text{ or } 23) = \frac{1}{38} + \frac{1}{38} = \frac{1}{19}$$

$$P(\text{Red}) = \frac{9}{19}$$

$$P(9 \text{ or } 23 \mid \text{Red}) = \frac{P(9 \text{ or } 23 \cap \text{Red})}{P(\text{Red})}$$

$$= \frac{\frac{1}{19}}{\frac{9}{19}}$$



Roulette

Example #2

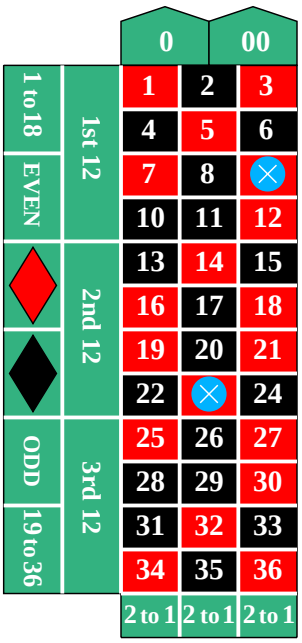
Answer:

$$P(9 \text{ or } 23) = \frac{1}{38} + \frac{1}{38} = \frac{1}{19}$$

$$P(\text{Red}) = \frac{9}{19}$$

$$P(9 \text{ or } 23 \mid \text{Red}) = \frac{P(9 \text{ or } 23 \cap \text{Red})}{P(\text{Red})}$$

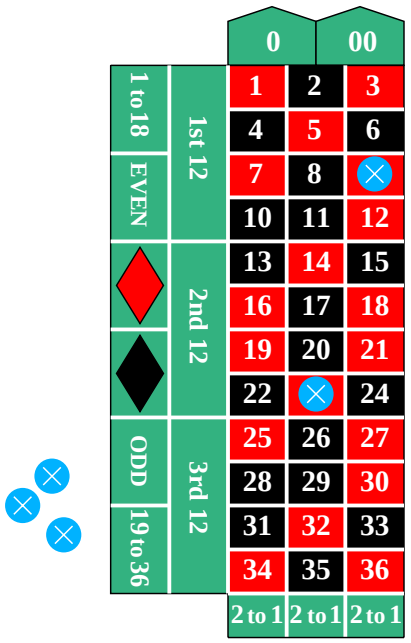
$$= \frac{\frac{1}{19}}{\frac{9}{19}} = \frac{1}{9}$$



Roulette

Example #2

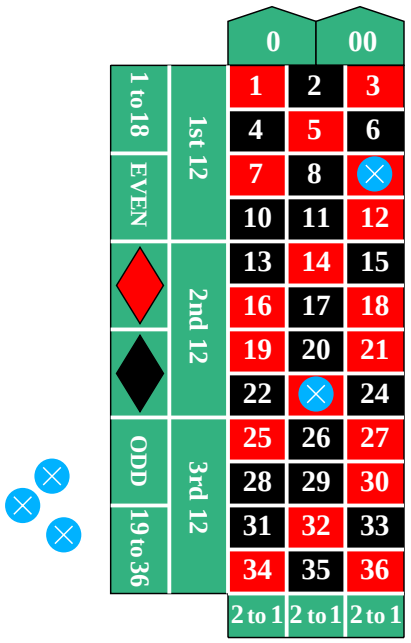
So, given that the number is red, your chances of winning are 1 out of 9.



Roulette

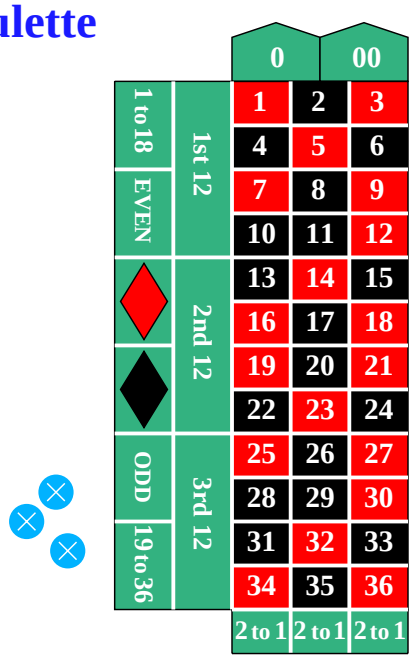
Example #2

If the winning number is 9 or 23, the payout is 36 times your bet. So, the payout is 35 chips plus the 1 winning chip on the table.



Roulette

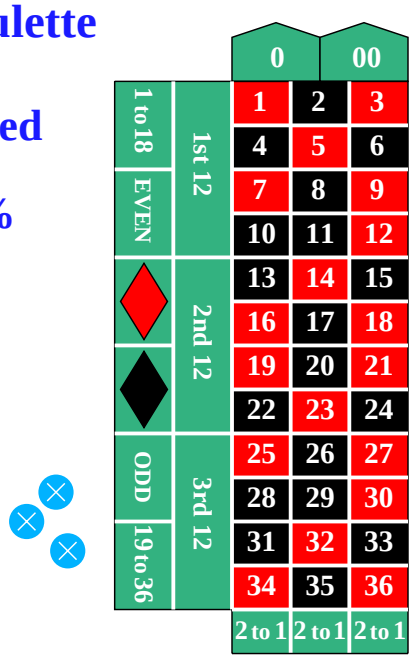
The Disadvantages of Playing Roulette



Roulette

The Disadvantages of Playing Roulette

The wheel has 38 partitions numbered 00, 0 to 36. Because of the 2 zero's, the house has an advantage of 5.26%



Roulette

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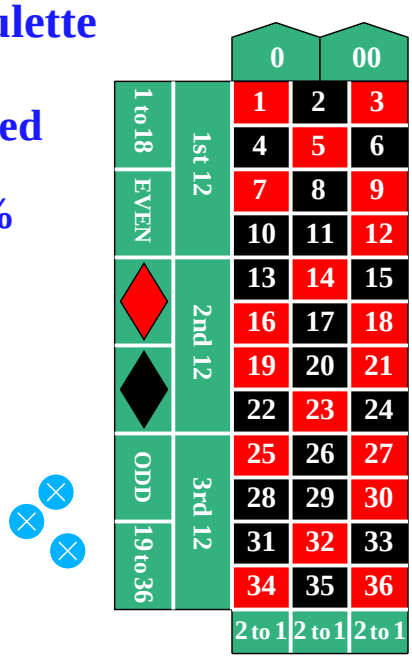
The wheel has 38 partitions numbered 00, 0 to 36. Because of the 2 zero's, the house has an advantage of 5.26%

This means that for every $10 bet the house will make an average of 52 cents profit.



Roulette

The Disadvantages of Playing Roulette

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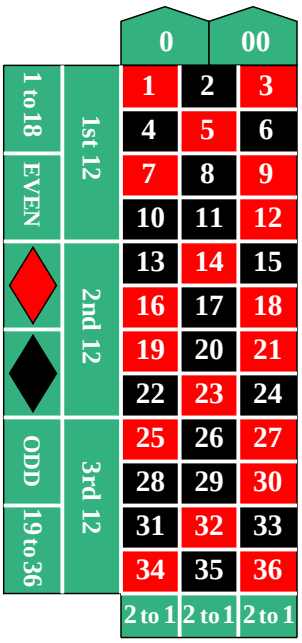
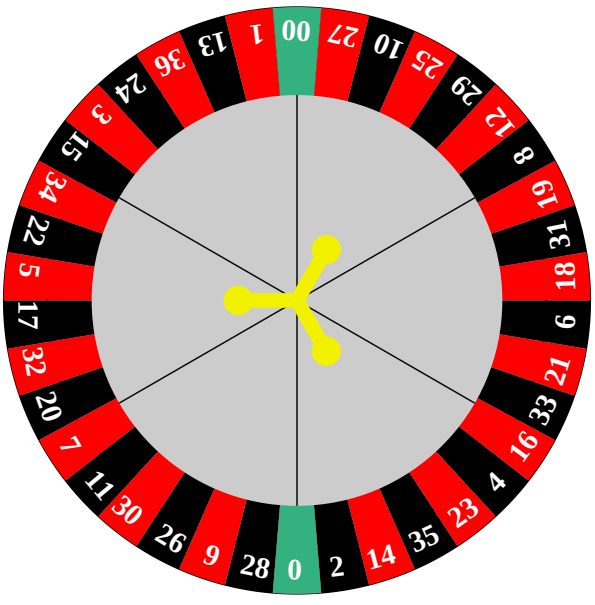
So, don't bother playing.



Roulette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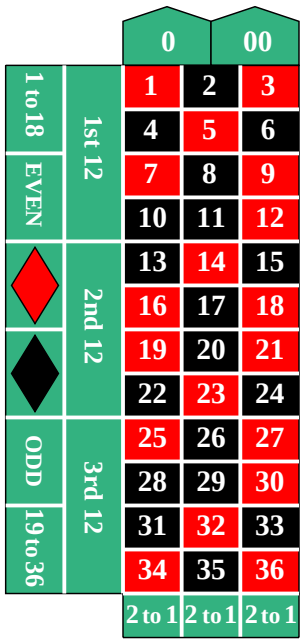
0
00
1 to 18
1st 12
1 2 3
4 5 6
7 8 9
10 11 12
EVEN
2nd 12
13 14 15
16 17 18
19 20 21
22 23 24
ODD
3rd 12
25 26 27
28 29 30
31 32 33
19 to 36
34 35 36
2 to 1
2 to 1
2 to 1