

Mathematical Analysis

Of The Following Game:

MATCH 52

April 14, 2023

Prepared By:

Michael Shackleford
Lollipop Guild, Inc.
Las Vegas, NV

Rules

The following are the rules of Match 52. Please refer to the images of the betting layout following the rules for clarification.

1. A single 52-card deck is used. The cards should be shuffled after every round.
2. The betting layout shall consist of four rows and 13 columns. The columns shall be labeled ace to king, in that order, from left to right. The columns shall be labeled, “Easy Street”, “Lucky Lane”, “Fortune’s Path”, and “Gambler’s Row” from top to bottom.
3. After betting is closed (see rule 10), the dealer shall deal the first card to the “A” column in the Easy Street row. If the card matches the column heading, in this case an ace, then the round will be over and winning bets will be adjudicated.
4. Otherwise, if the first card wasn’t an ace, then the second card will be dealt to the “2” column in Easy Street row. If that card matches the column heading, in this case a 2, then the round will be over and winning bets will be adjudicated.
5. This process of dealing across Easy Street will continue until a card matches the column heading or none of the 13 cards match their respective column heading.
6. If there are no matches in Easy Street, the dealer shall deal the 14th card to the A column in the Lucky Lane row. If that card is not an ace, then the dealer shall continue to deal across Lucky Lane until he reaches the end of that row or there is a match.
7. If there is no match in the first 26 cards, the dealer will deal across Fortune’s Path in the same manner. If there is no match in Fortune’s Path, then the dealer will go onto the final row, Gambler’s Row.
8. If the dealer gets through all 52 cards without a match, then there will be said to be “No Match” and bets on No Match will be adjudicated (there can be no other winners in this event).
9. All bets win or lose according to the row and/or column of the first match or no match at all.
10. The following types of bets are available:
 - Row and column of first match: There are 52 such bets available, one for each combination of 13 columns and 4 rows.
 - No Match: This bet wins if there is no match.
 - Easy Street, Lucky Lane, Fortune’s Path, Gambler’s Row: These bets win if the first match is anywhere on the chosen row.
 - A – K: There are 13 such bets, one for each column. Each wins if the first match is anywhere on that column.
 - Red, Black: These bets win according to the color of the card forming the first match. If there is no match, Red and Black bets lose.
 - Hearts, Spades, Clubs, Diamonds: These bets win according to the suit of the card forming the first match. If there is no match, then all suit bets lose.
11. See the analysis section for what winning bets pays.

The following image shows one version of the layout under what I call “pay table 1.”

MATCH52		Easy Street 0.5 to 1													MATCH52		
Lucky Lane 3 to 1		A	2	3	4	5	6	7	8	9	10	J	Q	K	Lucky Lane 3 to 1		
Fortune's Path 10 to 1		A	2	3	4	5	6	7	8	9	10	J	Q	K	Fortune's Path 10 to 1		
Gambler's Row 30 to 1		A	2	3	4	5	6	7	8	9	10	J	Q	K	Gambler's Row 30 to 1		
No Match 52 to 1		Any	Any	Any	Any	Any	Any	Any	Any	Any	Any	Any	Any	Any	No Match 52 to 1		
Black 1 to 1	♠ 3 to 1	♠ 3 to 1	♠ 3 to 1	♠ 3 to 1	♠ 3 to 1	♠ 3 to 1	♠ 3 to 1	♠ 3 to 1	♠ 3 to 1	♠ 3 to 1	♠ 3 to 1	♠ 3 to 1	♠ 3 to 1	♠ 3 to 1	♠ 3 to 1	♠ 3 to 1	Black 1 to 1

The next images shows another version of the layout and what I call “pay table 2.”

MATCH52		MATCH52														
No Match 52 to 1		Any	Any	Any	Any	Any	Any	Any	Any	Any	Any	Any	Any	Any	RED 1 to 1	
Easy Street 0.5 to 1		A	2	3	4	5	6	7	8	9	10	J	Q	K	BLACK 1 to 1	
Lucky Lane 3 to 1		A	2	3	4	5	6	7	8	9	10	J	Q	K	♥ 3 to 1	
Fortune's Path 10 to 1		A	2	3	4	5	6	7	8	9	10	J	Q	K	♠ 3 to 1	
Gambler's Row 30 to 1		A	2	3	4	5	6	7	8	9	10	J	Q	K	♦ 3 to 1	
		275	300	325	350	375	400	435	475	525	575	625	675	725	♣ 3 to 1	

Analysis

The following table shows my analysis of pay table 1. All pays are on a “to one” basis.

Bet	Pays	Probability	House Edge
Easy Street -- A	11	0.076929	0.076853
Easy Street -- 2	12	0.070886	0.078482
Easy Street -- 3	14	0.065338	0.019935
Easy Street -- 4	15	0.060230	0.036317
Easy Street -- 5	16	0.055538	0.055853
Easy Street -- 6	18	0.051209	0.027032
Easy Street -- 7	19	0.047222	0.055551
Easy Street -- 8	20	0.043560	0.085230
Easy Street -- 9	23	0.040178	0.035720
Easy Street -- 10	25	0.037071	0.036144
Easy Street -- J	27	0.034204	0.042281
Easy Street -- Q	30	0.031568	0.021382
Easy Street -- K	32	0.029135	0.038544
Lucky Lane -- A	34	0.027456	0.039035
Lucky Lane -- 2	37	0.025301	0.038571
Lucky Lane -- 3	40	0.023325	0.043689
Lucky Lane -- 4	44	0.021499	0.032550
Lucky Lane -- 5	48	0.019824	0.028637
Lucky Lane -- 6	52	0.018278	0.031253
Lucky Lane -- 7	56	0.016856	0.039232
Lucky Lane -- 8	61	0.015547	0.036079
Lucky Lane -- 9	67	0.014344	0.024633
Lucky Lane -- 10	72	0.013232	0.034098
Lucky Lane -- J	79	0.012209	0.023271
Lucky Lane -- Q	85	0.011266	0.031144
Lucky Lane -- K	92	0.010399	0.032921
Fortune's Path -- A	98	0.009800	0.029811
Fortune's Path -- 2	106	0.009032	0.033583
Fortune's Path -- 3	115	0.008323	0.034589
Fortune's Path -- 4	125	0.007672	0.033332
Fortune's Path -- 5	135	0.007074	0.037944
Fortune's Path -- 6	147	0.006523	0.034660
Fortune's Path -- 7	160	0.006016	0.031404
Fortune's Path -- 8	174	0.005549	0.028914
Fortune's Path -- 9	188	0.005121	0.032131
Fortune's Path -- 10	205	0.004723	0.027114

Fortune's Path -- J	222	0.004359	0.027993
Fortune's Path -- Q	240	0.004021	0.030830
Fortune's Path -- K	258	0.003712	0.038480
Gambler's Row -- A	275	0.003497	0.034772
Gambler's Row -- 2	300	0.003223	0.029834
Gambler's Row -- 3	325	0.002971	0.031593
Gambler's Row -- 4	350	0.002739	0.038566
Gambler's Row -- 5	375	0.002526	0.050380
Gambler's Row -- 6	400	0.002330	0.065782
Gambler's Row -- 7	435	0.002147	0.064092
Gambler's Row -- 8	475	0.001981	0.057075
Gambler's Row -- 9	525	0.001826	0.039440
Gambler's Row -- 10	575	0.001685	0.029152
Gambler's Row -- J	625	0.001556	0.025867
Gambler's Row -- Q	675	0.001435	0.029661
Gambler's Row -- K	725	0.001324	0.038751
No Match	52	0.016232	0.139726
Easy Street	0.5	0.643070	0.035395
Lucky Lane	3	0.229534	0.081865
Fortune's Path	10	0.081924	0.098832
Gambler's Row	30	0.029240	0.093557
Any suit	3	0.245942	0.016232
Any color	1	0.491884	0.016232
Any A	6	0.117682	0.176225
Any 2	7	0.108442	0.132465
Any 3	8	0.099955	0.100401
Any 4	9	0.092140	0.078598
Any 5	10	0.084961	0.065425
Any 6	11	0.078339	0.059927
Any 7	12	0.072241	0.060871
Any 8	13	0.066638	0.067074
Any 9	14	0.061469	0.077963
Any 10	15	0.056711	0.092621
Any J	16	0.052328	0.110420
Any Q	17	0.048291	0.130763
Any K	18	0.044570	0.153166

Minimum house edge = 1.62%

Maximum house edge = 17.62%

Average house edge = 5.26%

The following table shows my analysis of pay table 2. All pays are on a “to one” basis.

Bet	Pays	Probability	House Edge
Easy Street -- A	11.75	0.076929	0.019156
Easy Street -- 2	12.75	0.070886	0.025317
Easy Street -- 3	14.00	0.065338	0.019935
Easy Street -- 4	15.00	0.060230	0.036317
Easy Street -- 5	16.50	0.055538	0.028084
Easy Street -- 6	18.00	0.051209	0.027032
Easy Street -- 7	19.50	0.047222	0.031940
Easy Street -- 8	21.25	0.043560	0.030779
Easy Street -- 9	23.00	0.040178	0.035720
Easy Street -- 10	25.00	0.037071	0.036144
Easy Street -- J	27.50	0.034204	0.025179
Easy Street -- Q	30.00	0.031568	0.021382
Easy Street -- K	32.50	0.029135	0.023976
Lucky Lane -- A	34.50	0.027456	0.025307
Lucky Lane -- 2	37.50	0.025301	0.025921
Lucky Lane -- 3	40.50	0.023325	0.032027
Lucky Lane -- 4	44.00	0.021499	0.032550
Lucky Lane -- 5	48.00	0.019824	0.028637
Lucky Lane -- 6	52.00	0.018278	0.031253
Lucky Lane -- 7	56.00	0.016856	0.039232
Lucky Lane -- 8	61.50	0.015547	0.028306
Lucky Lane -- 9	67.00	0.014344	0.024633
Lucky Lane -- 10	72.50	0.013232	0.027482
Lucky Lane -- J	79.00	0.012209	0.023271
Lucky Lane -- Q	85.50	0.011266	0.025511
Lucky Lane -- K	92.00	0.010399	0.032921
Fortune's Path -- A	98.00	0.009800	0.029811
Fortune's Path -- 2	106.00	0.009032	0.033583
Fortune's Path -- 3	115.00	0.008323	0.034589
Fortune's Path -- 4	125.00	0.007672	0.033332
Fortune's Path -- 5	135.00	0.007074	0.037944
Fortune's Path -- 6	147.00	0.006523	0.034660
Fortune's Path -- 7	160.00	0.006016	0.031404
Fortune's Path -- 8	174.00	0.005549	0.028914
Fortune's Path -- 9	188.00	0.005121	0.032131
Fortune's Path -- 10	205.00	0.004723	0.027114
Fortune's Path -- J	222.00	0.004359	0.027993
Fortune's Path -- Q	240.00	0.004021	0.030830
Fortune's Path -- K	258.00	0.003712	0.038480
Gambler's Row -- A	275.00	0.003497	0.034772

Gambler's Row -- 2	300.00	0.003223	0.029834
Gambler's Row -- 3	325.00	0.002971	0.031593
Gambler's Row -- 4	350.00	0.002739	0.038566
Gambler's Row -- 5	375.00	0.002526	0.050380
Gambler's Row -- 6	400.00	0.002330	0.065782
Gambler's Row -- 7	435.00	0.002147	0.064092
Gambler's Row -- 8	475.00	0.001981	0.057075
Gambler's Row -- 9	525.00	0.001826	0.039440
Gambler's Row -- 10	575.00	0.001685	0.029152
Gambler's Row -- J	625.00	0.001556	0.025867
Gambler's Row -- Q	675.00	0.001435	0.029661
Gambler's Row -- K	725.00	0.001324	0.038751
No Match	52.00	0.016232	0.139726
Easy Street	0.50	0.643070	0.035395
Lucky Lane	3.00	0.229534	0.081865
Fortune's Path	10.00	0.081924	0.098832
Gambler's Row	30.00	0.029240	0.093557
Any suit	3.00	0.245942	0.016232
Any color	1.00	0.491884	0.016232
Any A	7.25	0.117682	0.029122
Any 2	8.00	0.108442	0.024023
Any 3	8.75	0.099955	0.025435
Any 4	9.50	0.092140	0.032528
Any 5	10.50	0.084961	0.022945
Any 6	11.50	0.078339	0.020758
Any 7	12.50	0.072241	0.024750
Any 8	13.50	0.066638	0.033755
Any 9	14.75	0.061469	0.031861
Any 10	16.00	0.056711	0.035910
Any J	17.50	0.052328	0.031927
Any Q	19.00	0.048291	0.034181
Any K	21.00	0.044570	0.019455

Minimum house edge = 1.62%

Maximum house edge = 13.97%

Average house edge = 3.53%

Conclusion

This analysis was done via a random simulation of over 4.9 billion games.

If you or any interested party have any questions, please contact me by any of the means below.

E-mail: shack31416@gmail.com

Phone: 702-858-1304

Regards,

A handwritten signature in black ink, appearing to read "Michael Shackleford". The signature is written in a cursive, flowing style.

Michael Shackleford