

# Maverick Solitaire and Three Card Poker

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## 1 Maverick Solitaire

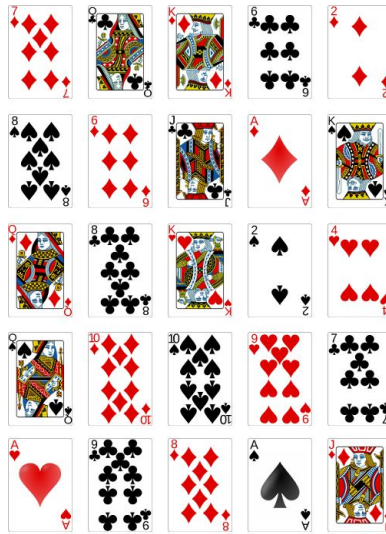
On January 19, 1958 the American Broadcasting Corporation aired the 17th episode of the first season of *Maverick*, a western starring James Garner. The episode was entitled “Rope of Cards.” Garner, portraying gambler Bret Maverick, was the only member of a jury who refused to vote the defendant guilty. During the jury deliberations Maverick claims that it is possible to take 25 cards dealt off the top of a shuffled deck and make five pat poker hands with them. A pat hand is one for which a player would not take extra cards in a game of draw poker. Pat hands are a straight, full house, flush, four of a kind (although one could change out the fifth card in a four of a kind, it will not really improve the strength of the hand, so it is considered pat), and straight flush. In this scene the director created a continuous shot of the twenty-five cards being dealt off and arranged into the five pat hands. It is alleged that there was no set-up involved—it truly was a randomized deck. This game, taking 25 cards and rearranging them, became known as Maverick Solitaire and within days of the episode airing nearly every store in the United States was sold out of playing cards [2].

The bet that one can make five pat hands out of 25 random cards is what is referred to as a “proposition bet,” where the odds seem to be stacked against the proposer (the person forming the hands) but are actually significantly in that person’s favor. Computer simulations say that the proposer will win 98% of the time.

Martin Gardner wrote about this in his book *Mathematical Magic Show* [1]. There he presented the following example of a deal which did could not be made into five pat hands<sup>1</sup>.

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<sup>1</sup>The key to this is the presence of the four of hearts.



## 2 Three Card Poker

Three-Card Poker is a casino game. Sometimes derisively called a Midway Game or Carnival Game because the odds of walking away with a profit are significantly against the player. The typical Three-Card Poker table has room for six players to sit, where they are not playing against each other like in a normal poker game. There are two games denoted by two different betting spots: Pairs Plus (where there is no opponent) and Ante-Play against the dealer (see the pictures below). In this note, we are looking at the Pairs Plus game.



The Pairs Plus Game is straightforward. A player places a bet on the yellow circle, is dealt three cards, and is paid off according to the odds whenever their hand is a pair or better.

In the Ante-Play game a player puts down a bet (the ante) and is dealt three cards. If the player wants to stay in and face the dealer's hand the player places a matching bet on the Play square. The dealer then reveals his/her hand. If the dealer has a queen or

higher, then he/she “qualifies” and the game is played. Whoever has the higher ranked hand wins. Ante pays 1-1 and Play pays 1-1. If the player has a straight or higher, there is an Ante Bonus paid out, too (a straight pays 1 to 1, three of a kind 4 to 1, straight flush 5 to 1). If the dealer does not qualify, the Play bet is returned to the player and the Ante bet pays 1-1.

Both games may be played with the same hand in one deal.

### 3 Result

The results of this investigation are very similar to the Maverick Solitaire result: Given any five “hands,” that is 15 cards, dealt, one can arrange the cards into five Three-Card Poker hands where each hand wins at the Pairs Plus game. This result was found by the taking the fifteen cards and breaking them up into their constituent suits (i.e., checking for flushes) and rearranging as necessary to make non-flush hands. For example,

In the case of 9 Clubs, 5 Hearts, and one Spade the Clubs and Hearts make 14 cards. There must be at least one card in common. If there are two in common, make two pair and three flushes. If the overlap is only one, then you must have one card of each rank and so there is a straight not involving the overlap card. Thus one straight, one pair, and three flushes. [4]

Since 9 Hearts, 5 Spades, one Clubs, and one Diamond is the same as 9 Spades, 5 Diamonds, one Club, and one Heart we do not have to check all permutations of the suits. This cuts down on the work, but still there were 52 possibilities to consider. Given that, we do not include every breakdown in this note.

We cannot guarantee four Pair Plus winning hands with 12 cards. If we have the Ace through Jack of Spades and the King of Hearts, the King cannot be a third card in a pair, cannot be used in a straight, or a flush, or a three of a kind.

There is still some openness in questions involving the game. Many, but not every, time at least one hand pays off in the Ante Bonus play. What percentage of the time can this occur? What percentage of the time can one make 4 winning Pair Plus hands and a Straight Flush paying 40-1?

### References

- [1] Gardner, Martin, *Mathematical Magic Show*, 94 - 104.
- [2] Maverick, “Rope of Cards,” International Movie Database, [www.imdb.com](http://www.imdb.com).
- [3] Maverick Solitaire Website, [www.solitairelaboratory.com/maverick.html](http://www.solitairelaboratory.com/maverick.html).
- [4] Vallin, Robert W., “Three-Card Poker Writeup,” (not submitted).