










Number of ways of getting each Poker Hand

	$n(\text{royal flush}) =$	4C_1		$= 4$		
	choose 1 suit					
	$n(\text{straight flush}) =$	10	4C_1	–	4	$= 36$
	a straight can start with A, 2, 3, ... or 10		choose 1 suit		royal flushes	
	$n(4 \text{ of a kind}) =$	${}^{13}C_1$	4C_4	${}^{12}C_1$	4C_1	$= 624$
	choose 1 face value	choose 4 cards with this face value	choose 1 other face value	choose 1 card with this face value		
	$n(\text{full house}) =$	${}^{13}C_1$	4C_3	${}^{12}C_1$	4C_2	$= 3744$
	choose 1 face value	choose 3 cards with this face value	choose 1 other face value	choose 2 cards with this face value		
	$n(\text{flush}) =$	4C_1	${}^{13}C_5$	–	40	$= 5108$
	choose 1 suit	choose 5 cards from this suit		straight flushes & royal flushes		
	$n(\text{straight}) =$	10	$({}^4C_1)^5$	–	40	$= 10200$
	a straight can start with A, 2, 3, ... or 10	choose 5 cards with these face values		straight flushes & royal flushes		
	$n(3 \text{ of a kind}) =$	${}^{13}C_1$	4C_3	${}^{12}C_2$	$({}^4C_1)^2$	$= 54912$
	choose 1 face value	choose 3 cards with this face value	choose 2 other face values	choose 2 cards with these face values		
	$n(2 \text{ pairs}) =$	${}^{13}C_2$	$({}^4C_2)^2$	${}^{11}C_1$	4C_1	$= 123552$
	choose 2 face values	choose 2 cards with each of these 2 face values	choose 1 other face value	choose 1 card with this face value		
	$n(1 \text{ pair}) =$	${}^{13}C_1$	4C_2	${}^{12}C_3$	$({}^4C_1)^3$	$= 1098240$
	choose 1 face value	choose 2 cards with this face value	choose 3 other face values	choose 3 cards with these face values		
	$n(\text{no pair}) =$	${}^{13}C_5$	$({}^4C_1)^5$	– 10200	– 5148	$= 1302540$
	choose 5 face values	choose 5 cards with these face values	subtract straights	subtract flushes, straight flushes, royal flushes		
	Total =	${}^{52}C_5$				= 2598960

A straight flush is a hand that contains five cards in sequence, all of the same suit, such as Q♣ J♣ 10♣ 9♣ 8♣ (a hand that meets the requirement of both a straight and a flush).

An ace-high straight flush such as A♦ K♦ Q♦ J♦ 10♦ is known as a royal flush

Four of a kind is a poker hand such as 9♣ 9♠ 9♦ 9♥ J♥, that contains all four cards of one rank and any other (unmatched) card.

A full house is a hand such as 3♣ 3♠ 3♦ 6♣ 6♥, that contains three matching cards of one rank and two matching cards of another rank.

A flush is a poker hand such as Q♣ 10♣ 7♣ 6♣ 4♣, where all five cards are of the same suit, but not in sequence.

A straight is a poker hand such as Q♣ J♠ 10♠ 9♥ 8♥, that contains five cards of sequential rank in at least two different suits.

Three of a kind is a poker hand such as 2♦ 2♠ 2♣ K♠ 6♥ that contains three cards of the same rank, plus two cards which are not of this rank nor the same as each other.

A poker hand such as J♥ J♣ 4♣ 4♠ 9♥, that contains two cards of the same rank, plus two cards of another rank (that match each other but not the first pair), plus any card not of either rank, is called two pair.