

	Independent Counts	Dependent Counts
Long Royal Flush	$\binom{4}{1} = 4$	$\binom{4}{1} = 4$
Long Straight Flush	$\binom{9}{1} \binom{4}{1} = 36$	$\binom{9}{1} \binom{4}{1} - \binom{4}{1} = 32$
Short Royal Flush	$\binom{4}{1} \binom{47}{1} = 188$	$\binom{4}{1} \binom{46}{1} = 184$
Full Hotel	$\binom{13}{1} \binom{12}{1} \binom{4}{2} = 936$	$\binom{13}{1} \binom{12}{1} \binom{4}{2} = 936$
Two Triples	$\binom{13}{2} \binom{4}{3}^2 = 1,248$	$\binom{13}{2} \binom{4}{3}^2 = 1,248$
Short Straight Flush	$\binom{10}{1} \binom{4}{1} \binom{47}{1} - \binom{9}{1} \binom{4}{1} = 1,844.$	$\binom{10}{1} \binom{4}{1} \binom{47}{1} - \binom{9}{1} \binom{4}{1} - \binom{4}{1} \binom{46}{1} - \binom{9}{1} \binom{4}{1} = 1,624.$
Long Flush	$\binom{13}{6} \binom{4}{1} = 6,864$	$\binom{13}{6} \binom{4}{1} - \binom{9}{1} \binom{4}{1} - 2 \binom{4}{1} \binom{7}{1} - 8 \binom{4}{1} \binom{6}{1} = 6,580.$
Four of a Kind	$\binom{13}{1} \binom{48}{2} = 14,664$	$\binom{13}{1} \binom{48}{2} - \binom{13}{1} \binom{12}{1} \binom{4}{2} = 13,728$
Long Straight	$\binom{9}{1} \binom{4}{1}^6 = 36,864$	$\binom{9}{1} \binom{4}{1}^6 - \binom{9}{1} \binom{4}{1} - 9 \cdot 24 = 36,612$
Three Pair	$\binom{13}{3} \binom{4}{2}^3 = 61,776$	$\binom{13}{3} \binom{4}{2}^3 = 61,776$
Full House	$\binom{13}{1} \binom{4}{3} \binom{12}{1} \binom{4}{2} \binom{11}{1} \binom{4}{1} + \binom{13}{2} \binom{4}{3}^2 + \binom{13}{1} \binom{12}{1} \binom{4}{2} = 166,920.$	$\binom{13}{1} \binom{4}{3} \binom{12}{1} \binom{4}{2} \binom{11}{1} \binom{4}{1} = 164,736.$
Short Flush	$\binom{4}{1} \binom{13}{5} \binom{39}{1} + \binom{4}{1} \binom{13}{6} = 207,636.$	$4 \binom{13}{5} (52 - 13) - 2 \cdot 4 \cdot 3 \cdot (13 - 1) - 8 \cdot 4 \cdot 3 (13 - 2) - 9 \cdot 4 \cdot 3 \cdot 6 = 198,780.$
Short Straight	$2 \cdot 4^5 (52 - 20 - 4) + 8 \cdot 4^5 (52 - 20 - 8) + 9 \cdot 4^6 + 10 \cdot 5 \binom{4}{2} 4^4 = 367,616.$	$[2 \cdot 4^5 (52 - 20 - 4) + 8 \cdot 4^5 (52 - 20 - 8) + 9 \cdot 4^6 + 10 \cdot 5 \binom{4}{2} 4^4] - \binom{9}{1} \binom{4}{1}^6 - 2 \cdot 4 (52 - 13 - 3) - 2 \cdot 4 \cdot 5 \cdot 3 (13 - 5 - 1) - 8 \cdot 4 (52 - 13 - 6) - 8 \cdot 4 \cdot 5 \cdot 3 (13 - 5 - 2) - 2 \cdot 4 (13 - 5 - 1) - 8 \cdot 4 (13 - 5 - 2) = 325,440.$
Three of a Kind	$\binom{13}{1} \binom{4}{3} \binom{12}{3} \binom{4}{1}^3 + \binom{13}{1} \binom{4}{3} \binom{12}{1} \binom{4}{2} \binom{11}{1} \binom{4}{1} + \binom{13}{1} \binom{12}{2} \binom{4}{1}^2 + \binom{13}{1} \binom{12}{1} \binom{4}{2} + \binom{13}{2} \binom{4}{1}^2 = 912,808.$	$\binom{13}{1} \binom{4}{3} \binom{12}{3} \binom{4}{1}^3 = 732,160$

Two Pair	$\binom{13}{2}\binom{4}{2}^2\binom{11}{2}\binom{4}{1}^2 + \binom{13}{3}\binom{4}{2}^3 +$ $\binom{13}{1}\binom{4}{3}\binom{12}{1}\binom{4}{2}\binom{11}{1}\binom{4}{1} +$ $\binom{13}{1}\binom{12}{1}\binom{4}{2} + \binom{13}{1}\binom{12}{2}\binom{4}{1}^2 +$ $\binom{13}{2}\binom{4}{3}^2 = 2,713,464.$	$\binom{13}{2}\binom{4}{2}^2\binom{11}{2}\binom{4}{1}^2 = 2,471,040$
One Pair	$\binom{52}{6} - \binom{13}{6}\binom{4}{1}^6 = 13,329,784$	$13\binom{4}{2}\binom{12}{4}4^4 - 13\binom{4}{2}2\binom{12}{4} - 10 \cdot$ $5\binom{4}{2}(4^4 - 2) = 9,730,740.$
High Card	$\binom{52}{6} = 20,358,520$	$\binom{52}{6} - \left[\binom{52}{6} - \binom{13}{6}\binom{4}{1}^6 \right] - \binom{13}{6}(4 \cdot 6 \cdot$ $3 + 4) - 2(13 - 5 - 1)(4^6 - 4 \cdot 6 \cdot 3 -$ $4) - 8(13 - 5 - 2)(4^6 - 4 \cdot 6 \cdot 3 -$ $4) - 9(4^6 - 4 \cdot 6 \cdot 3 - 4) = 6,612,900.$