

Probability of two or more players flopping strong hands

Flopping things ...	Probability	Formula
<i>Set over set</i>		
Flopping a set or better with a pair	11.8% (1 : 7.5)	$1 - \binom{48}{3} \times \binom{50}{3}^{-1}$
Being dealt a pair and flopping a set	0.691% (1 : 144)	$13 \times 6 \times \binom{52}{2} \times \left(1 - \binom{48}{3} \times \binom{50}{3}^{-1}\right)$
If two players have a pair, both flop a set	1.06% (1 : 93)	$2 \times 2 \times 46 \times \binom{50}{3}^{-1}$
Two players are dealt a pair and both flop a set (<i>heads-up</i>)	0.003518% (1 : 28,423)	$4^3 \times \binom{13}{3} \times \binom{52}{3}^{-1} \times 9 \times \binom{49}{2}^{-1} \times 6 \times \binom{47}{2}^{-1}$
Two players are dealt a pair and both flop a set (<i>full-ring</i>)	0.127% (1 : 789)	$4^3 \times \binom{13}{3} \times \binom{52}{3}^{-1} \times \binom{9}{2} \times 9 \times \binom{49}{2}^{-1} \times 6 \times \binom{47}{2}^{-1}$
<i>Set over set over set</i>		
If three players have a pair, all flop a set	0.0463% (1 : 2,161)	$2 \times 2 \times 2 \times \binom{48}{3}^{-1}$
Three players are dealt a pair and all flop a set (<i>3 player table</i>)	0.00001066% (1 : 9,379,926)	$4^3 \times \binom{13}{3} \times \binom{52}{3}^{-1} \times 9 \times \binom{49}{2}^{-1} \times 6 \times \binom{47}{2}^{-1} \times 3 \times \binom{45}{2}^{-1}$
Two players are dealt a pair and both flop a set (<i>full-ring</i>)	0.0008955% (1 : 111,665)	$4^3 \times \binom{13}{3} \times \binom{52}{3}^{-1} \times \binom{9}{3} \times 9 \times \binom{49}{2}^{-1} \times 6 \times \binom{47}{2}^{-1} \times 3 \times \binom{45}{2}^{-1}$
<i>Quads over quads</i>		
Hitting quads with a pair until the river	0.816% (1 : 122)	$\binom{48}{3} \times \binom{50}{5}^{-1}$
If two players have a pair, both hit quads until the river	0.002077% (1 : 48,153)	$44 \times \binom{50}{5}^{-1}$
Two players have a pocket pair and make quads (<i>heads-up</i>)	0.000008884% (1 : 11,255,912)	$132 \times \binom{4}{2}^2 \times 44 \times \binom{52}{3}^{-1} \times 2 \times \binom{47}{2}^{-1} \times \binom{45}{2}^{-1}$
Two players have a pocket pair and make quads (<i>full-ring</i>)	0.0003198% (1 : 312,663)	$132 \times \binom{4}{2}^2 \times 44 \times \binom{52}{3}^{-1} \times 92 \times 2 \times \binom{47}{2}^{-1} \times \binom{45}{2}^{-1}$
<i>Flush over flush</i>		
Flopping a flush with two suited cards	0.842% (1 : 118)	$\binom{11}{3} \times \binom{50}{3}^{-1}$
Being dealt suited cards and flopping a flush	0.198% (1 : 504)	$\binom{13}{2} \times 4 \times \binom{52}{2}^{-1} \times \binom{11}{3} \times \binom{50}{3}^{-1}$
If two players have suited cards, both flop a flush	0.486% (1 : 205)	$\binom{9}{3} \times \binom{48}{3}^{-1}$
Two players are dealt suited cards and both flop a flush (<i>heads-up</i>)	0.005131% (1 : 19,490)	$\binom{13}{3} \times 4 \times \binom{52}{3}^{-1} \times \binom{10}{2} \times \binom{49}{2}^{-1} \times \binom{8}{2} \times \binom{47}{2}^{-1}$
Two players are dealt suited cards and both flop a flush (<i>full-ring</i>)	0.185% (1 : 540)	$\binom{13}{3} \times 4 \times \binom{52}{3}^{-1} \times \binom{9}{2} \times \binom{10}{2} \times \binom{49}{2}^{-1} \times \binom{8}{2} \times \binom{47}{2}^{-1}$
<i>Flush over flush over flush</i>		
If three players have suited cards, all flop a flush	0.231% (1 : 433)	$\binom{7}{3} \times \binom{46}{3}^{-1}$
Three players are dealt suited cards and all flop a flush (<i>3 player table</i>)	0.00007774% (1 : 1,286,389)	$\binom{13}{3} \times 4 \times \binom{52}{3}^{-1} \times \binom{10}{2} \times \binom{49}{2}^{-1} \times \binom{8}{2} \times \binom{47}{2}^{-1} \times \binom{6}{2} \times \binom{45}{2}^{-1}$
Three players are dealt suited cards and all flop a flush (<i>full-ring</i>)	0.006530% (1 : 15,313)	$\binom{13}{3} \times 4 \times \binom{52}{3}^{-1} \times \binom{9}{3} \times \binom{10}{2} \times \binom{49}{2}^{-1} \times \binom{8}{2} \times \binom{47}{2}^{-1} \times \binom{6}{2} \times \binom{45}{2}^{-1}$

heads-up: playing against one opponent; **full-ring:** playing at a table with 9 players