1 Q_1 Q_2 Q_8

$\left(\cancel{\frac{15}{15}}\right)\left(\frac{14}{15}\right) \dots \left(\frac{8}{15}\right) = .1012369\dots$

$=1$

$\approx \boxed{10.12\% \text{ chance}}$

(odd) (odd) (even)

2 ~~Six~~ 4 7 6 5

~~average~~ # of options ~~to~~ : $\frac{5 \cdot 4 \cdot 7 \cdot 6 \cdot 5}{10^5}$ = Chance of pulling this number in 1 generation.

$\Omega = 10^5$

$= .042$

$\approx 4.2\%$ we get !

Binomial $(p=5)$ out of 8

$= \binom{n}{k} p^k q^{n-k}$

p-event
q-event fail
n = # of trials

$\binom{8}{5}(.042)^5(.958)^3$

$= \boxed{6.43474 \times 10^{-6}}$

3 A: event 2 dice yield 4's, 5's, or 6's
B: uniform rolls,

$\boxed{\text{Independent}}$

NO event tells info of other, i.e. if 2 dice roll similar 4, 5, or 6 doesn't say anything about B and if all are same, doesn't say what value it is.

Scanned with CamScanner

(4) first get probability of flush.

$\binom{52}{5}$ = all 5 card hands

first card doesn't matter

Card 2	3	4	5
$\frac{12}{51}$	$\frac{11}{50}$	$\frac{10}{49}$	$\frac{9}{48}$

$= \cancel{.00198079}$

$\alpha = .00198079 23...$

$\frac{1}{\alpha}$ = # of expected games needed.

$\approx$ 504.8 hands (Expected)

$\approx$ 505 games to get a flush. (real value) rounded to whole hand.

(5)

$P(W \mid \text{superstar}) = 70\%$

$P(W \mid \text{No star}) = 50\%$

won $4/5 = .8$

$p = .7 \quad q = .3$

$P(W(\frac{4}{5}) \mid \text{Superstar}) = \binom{5}{4}(p)^4 q = .36015$

$P(W(\frac{4}{5}) \mid \text{No star}) = \binom{5}{4}(.5)^4(.5) = .1563$

$P(\text{Super plays}) = .75$

Prob of win $= .1563(.25) + (.36015)(.75) = .309175$

using Bayes we obtain

$P(\text{Super} \mid W(\frac{4}{5})) = \frac{.36015}{.309175} \cdot (.75) = .873651$

$\approx \boxed{87.37\%}$