$$\binom{15}{8} = \frac{15!}{8!(15-8)!} = 259459200 \Rightarrow \frac{259459200}{15^8} = 0.101237$$

2.

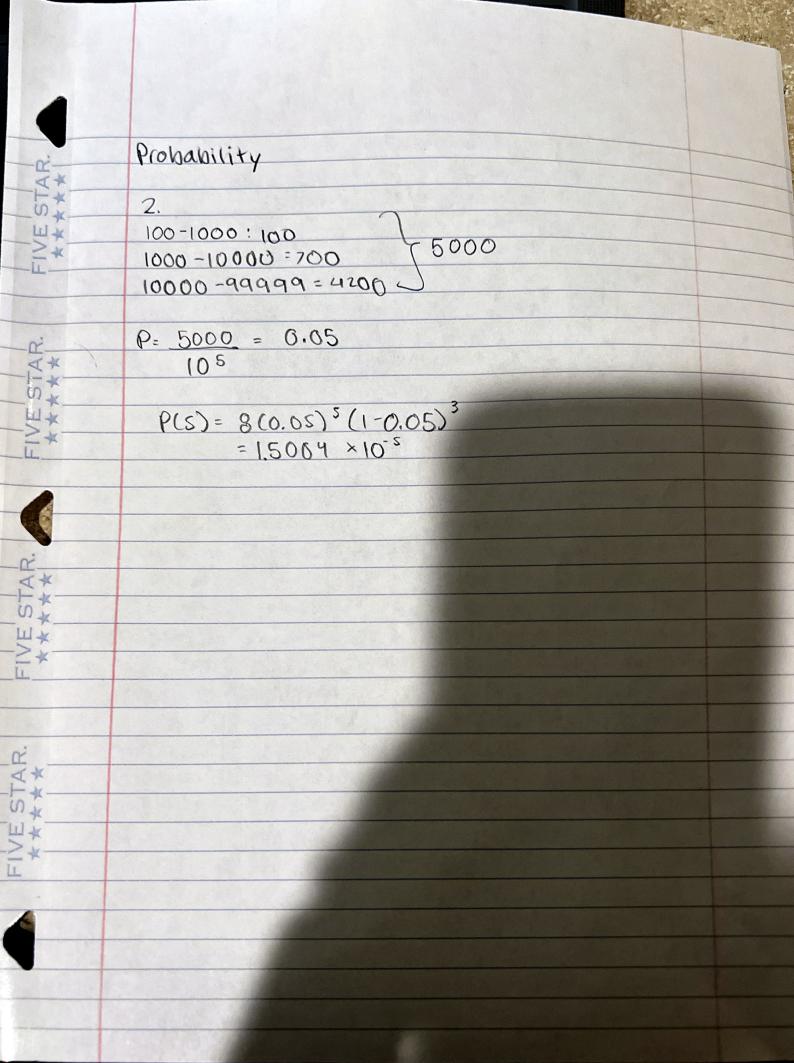
$$P(a+least 2 \text{ dice show u or above}) = P(A)$$

 $P(A) = P(X=2) + P(X=3) = \frac{1}{2}$

P(all 3 dice show the same value) =
$$\frac{6}{6^3} = \frac{1}{36}$$

P(A). P(B) = $\frac{1}{2}$. $\frac{1}{36} = \frac{1}{22}$

$$\frac{1}{12} = \frac{1}{72}$$
 / independent



4.
$$P(\text{flush on 5 card hand}) = \frac{\binom{13}{5} \cdot 4}{\binom{51}{5}} = 0.001980792$$

Find expected num of hands to play to get a flush. Let's call this X

$$p = 0.001980792$$

$$\frac{1}{p} = \frac{1}{0.001980792} = E[\times] \sim 504.85$$

5. Win= W
super star plays =
$$S = .75$$

no super star plays = $S = 0.25$
 $P(w1s) = .7$
 $P(w1s) = .5$
 $P(s) = 0.75 \Rightarrow for next 5 games$
 $P(w4/5|S) = {5 \choose 4} \cdot (0.7)^4 \cdot (.3) = 0.36015$
 $P(w4/5|S^c) = {5 \choose 4} \cdot (0.5)^4 = 0.15625$
 $P(S1w4/s) = ?$
 $P(w4/5) = P(w4/5|S) \cdot P(S) + P(w4/5|S^c) \cdot P(S^c)$
 $= 0.3601S \cdot (.7) + 0.15625 \cdot (0.25)$
 $= 0.309175$

$$P(s \mid w \mid 4/s) = \underbrace{P(w \mid 4/s \mid 5) \cdot P(s)}_{P(w \mid 4/s)} = \underbrace{0.36015(.7s)}_{0.309175}$$
$$= 0.8737$$