PROBABILITY

4/10 NOTES

Probability: ratio comparing the number of ways an event can occur to the number of possible outcomes.

Example: rolling a die $P(5)=\frac{1}{6}$

*can be expressed as a percent $P(\text{even})=\frac{3}{6}$

$\frac{1}{2}=50\%$

$P(7)=0$ NEVER occur!

$P(\text{even or odd})=1$ CERTAIN to occur!

$\rightarrow 100\%$

compound events: consists of 2 or more simple events.

— OR —

(1) $P(3 \text{ or } 6)=$

$\frac{1}{6}+\frac{1}{6}=\frac{2}{6}=\boxed{\frac{1}{3}}$

— AND — "then"

$P(3 \text{ and } 6)=$

$\frac{1}{6}\times\frac{1}{6}=\boxed{\frac{1}{36}}$ (2)

6 - RED 4 - WHITE 8 - BLACK

(1) $P(\text{Red or black})=$

$\frac{6}{18}+\frac{8}{18}\ \frac{14}{18}\ \boxed{\frac{7}{9}}$

$P(\text{Red \& black})=$

$\frac{\cancel{6}^{1}}{\cancel{9}_{3}}\times\frac{\cancel{8}^{4}}{\cancel{18}_{3}}=\boxed{\frac{4}{27}}$ (2)

(1) $P(\text{Red or Q})=$

$\frac{26}{52}+\frac{4}{52}=\frac{30}{52}=\boxed{\frac{15}{26}}$

$P(\text{Red \& Q})=$

$\frac{1}{13}\ \frac{\cancel{26}}{\cancel{52}}\times\frac{\cancel{4}}{\cancel{52}}\ \frac{1}{2}=\boxed{\frac{1}{26}}$ (2)

$\frac{1}{2}\times\frac{1}{2}\times\frac{1}{2}=\boxed{\frac{1}{8}}$ (3)

4/11

Sample space

sample space: different methods of listing all possible outcomes.

TABLES | TREE DIAGRAMS | LISTS

x	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

Total outcomes: 36

Player 1 = even

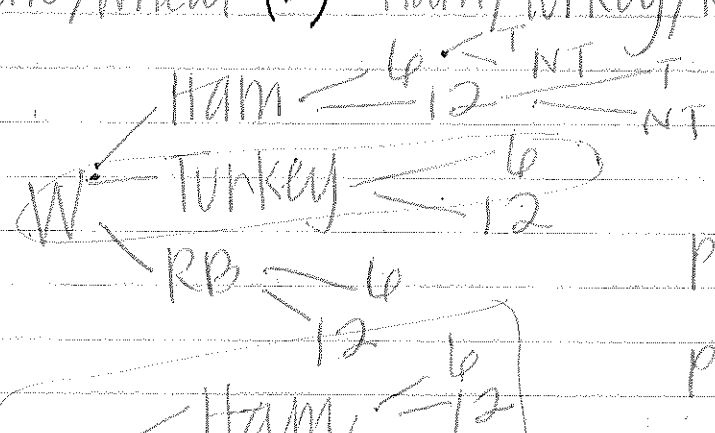
$\frac{18}{36} = \frac{1}{2} = 50\%$

Player 2 = > 7

$\frac{15}{36} = \frac{5}{12}$

White/Wheat (2) Ham/Turkey/RB (3) 6/12 (2)

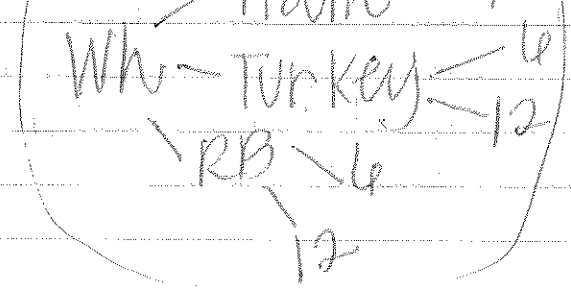
Toasted/Not (2)



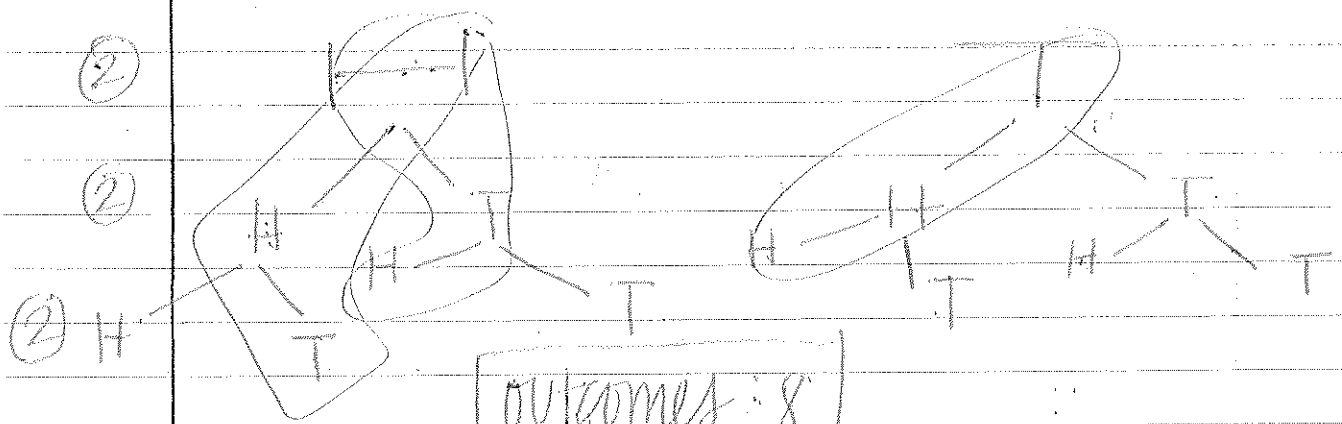
outcomes: 12

$P(W, T, 6) = \frac{1}{12}$

$P(Wh) = \frac{6}{12} = \frac{1}{2}$



flip a coin 3 times



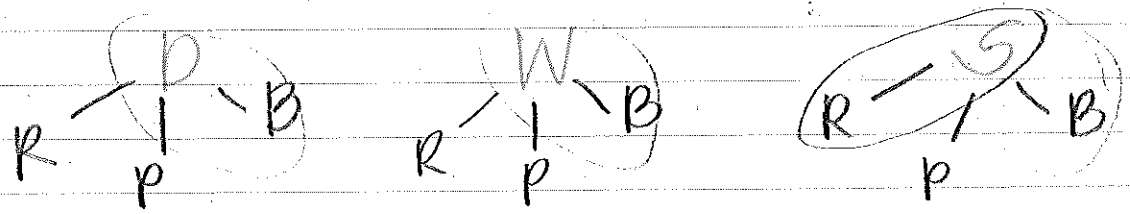
$\boxed{\text{outcomes: } 8}$

$P(H,H,T) = \frac{1}{8}$ $\quad$ $P(2H,T) = \frac{3}{8}$

$\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$ $\quad$ $P(3T) = \frac{1}{8}$

3 shorts	Denim	White	Striped
3 Shirts	Red	Pink	Blue

X	Denim	White	Stiped	
Red	R, D	R, W	R, S	
Pink	P, D	P, W	P, S	$P(R,S) = \frac{1}{9}$
Blue	B, D	B, W	B, S	$P(B) = \frac{1}{3}$



Denim, Red	Denim, Pink	Denim, Blue
White, Red	White, Pink	White, Blue
Stiped, Red	Stiped, Pink	Stiped, Blue