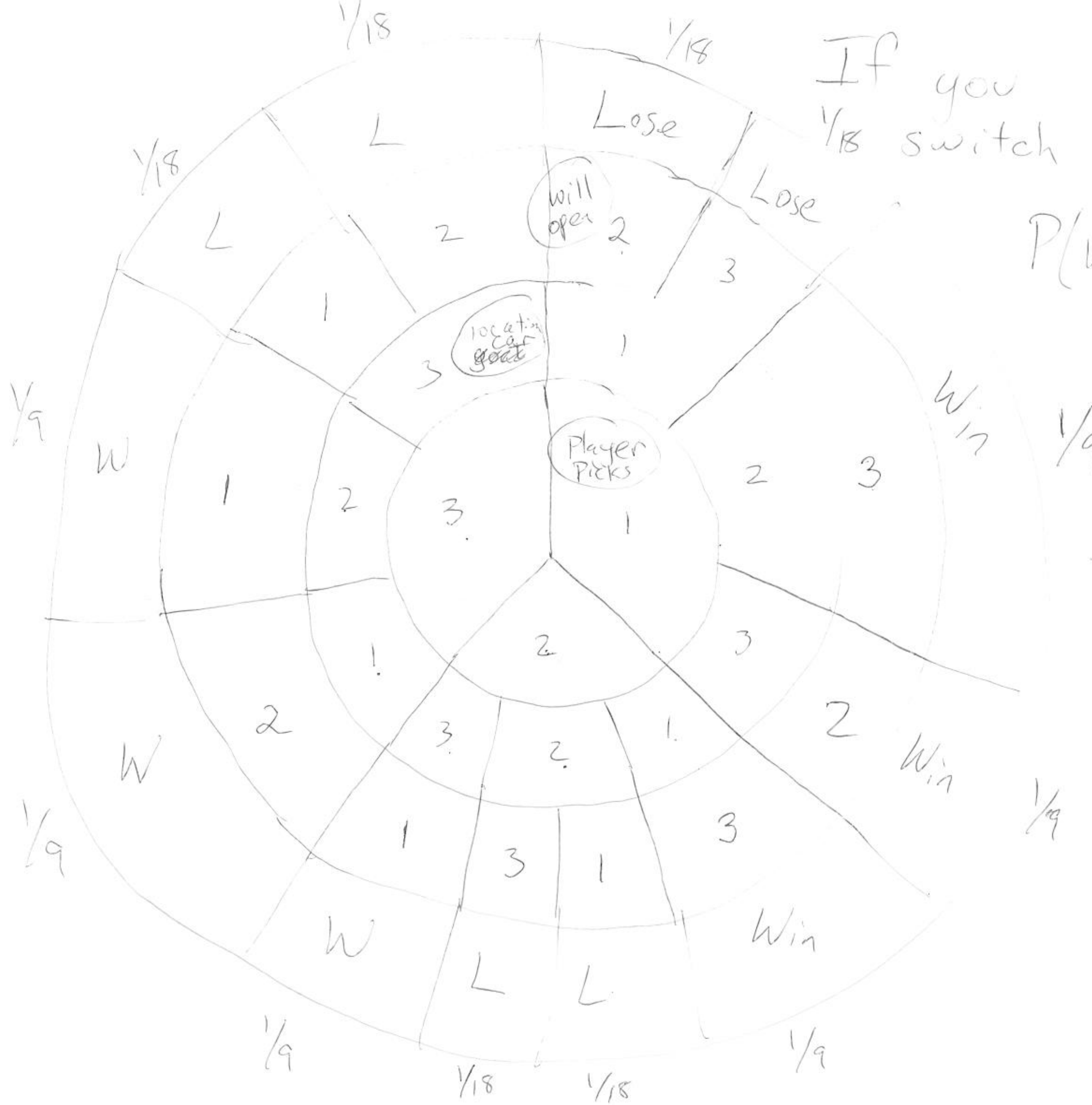


If you switch
P(Win) = 2/3

If you don't switch
P(Win) = 1/3

aaa	7·5·5 / 14·10·10
aad	0
aas	7·5·2 / 1400
aaf	7·5·3 / 1400
daa	0
dad	0
das	0
daf	0
saa	3·2·5 / 1400
sad	0
sas	3·2·2 / 1400
saf	3·2·3 / 1400
faa	4·6·5 / 1400
fad	0
fas	4·6·2 / 1400
faf	4·6·3 / 1400

/1400

(3) The encrypting matrix for a Hill transformation mod 26 has the form

$$\begin{bmatrix} 3 & * \\ 5 & * \end{bmatrix}$$

Find the plaintext and the decrypting matrix if you know that the first two letters of the cyphertext NUMQDOBA correspond to the letters IT and the last two correspond to ET in the plaintext.

plaintext:

decrypting matrix:

(4) A random procedure for choosing a three letter word is determined from the charts below. The first letter is chosen with probability given by the table on the left. The second and third letters are chosen using the table on the right where the entries represent the probability of the subsequent letter given the previous letter.

a	7
s	3
d	0
f	4

	a	s	d	f
a	5	2	0	3
s	2	4	4	0
d	0	5	4	1
f	6	0	2	2

(a) What is the probability of the word 'sas'?
(b) What is the probability of the word 'sas' given that the second letter is 'a'?
(c) What is the probability of the word 'sas' given that the third letter is 's'?
(d) What is the probability of the word 'sas' given that the second and third letter are 'as'?

(4)(a) $\frac{3}{14} \cdot \frac{2}{10} \cdot \frac{2}{10} = 3/350$

(4)(b)

(4)(c)

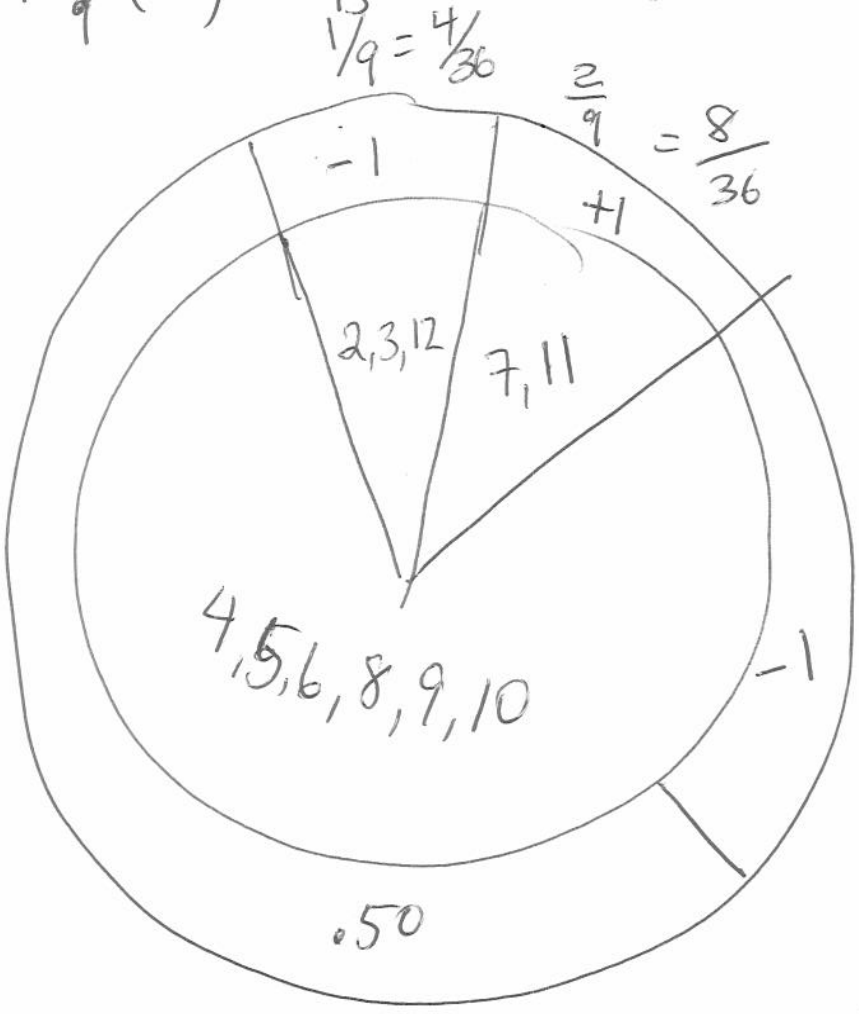
(4)(d)

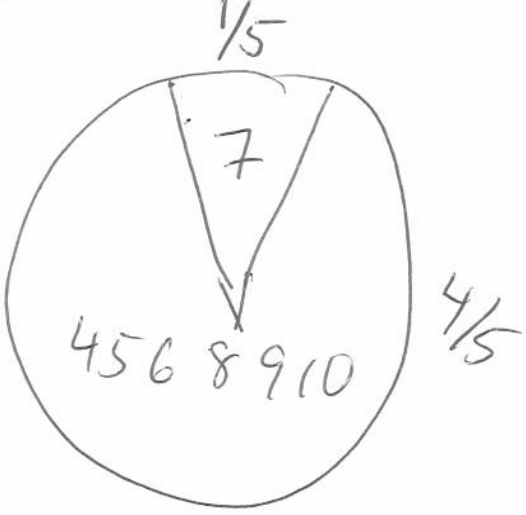
$$P(\text{word} = sas \mid \text{second letter} = a) = \frac{P(\text{word} = sas \ \& \ \text{second} = a)}{P(\text{second} = 'a')}$$

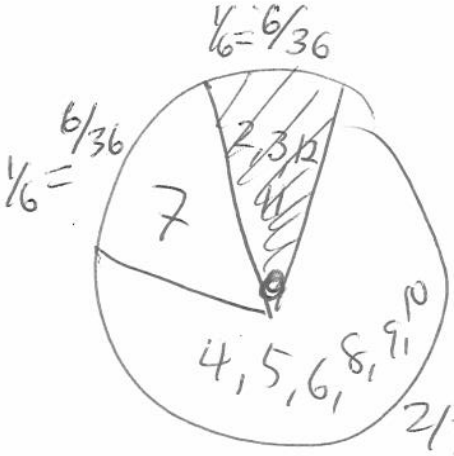
$$= 3/350$$

$$P(\text{second letter } 'a') = \sum_{w = \text{a word with second letter } a} P(\text{word} = w)$$

$$\frac{1}{9}\cdot(-1)+\frac{2}{9}(+1)+\frac{2}{15}\cdot(-1)+\frac{8}{15}\cdot(.50)=$$







$$P(7 \mid 4\,5\,6\,7\,8\,9\,10)$$

$$1/5 = 6/36 \,/\, 30/36 = P(7 \,\&\, 4\,5\,6\,7\,8\,9\,10) \,/\, P(4\,5\,6\,7\,8\,9\,10)$$