

pg. 251 #1-4, 10ab

[illegible]

2a) $t_{8,3}$

b) $t_{52,41}$

$$c) \quad t_{n,r} = t_{n-1,r-1} + t_{n-1,r}$$

d) $t_{n-1, r-1}$

$$t_{n+r-1} = t_{n-r} - t_{n-1,r}$$

$$t_{18,12} - t_{17,12}$$

$$= t_{17,11}$$

3a) 2^{12}

b) 2^{20}

c) 2^{25}

d) $2^{(n-1)}$

4a) $2^n = 256$
 $n = 8$

$$\text{b) } 2^n = 2048$$

$$n = 2^{11}$$

c) $2^n = 16384$
 $n = 14$

2) $2^n = 65\,536$
 $n = 16$

5a) results = 0 (symmetrical numbers)

$$1 - 9 + 36 - 84 + 126 - 126 + 84 - 36 + 9 - 1 = 0$$

c) a.

(b) $t_{2n,n}$

12-1

$$1^2 + 1^2 = 2$$

$$1^2 + 2^2 + 1^2 = 6$$

$$1^2 + 3^2 + 3^2 + 1^2 = 11$$

$$1^2 + 4^2 + 6^2 + 4^2 + 1^2 = 70$$

10a) 0, 1, 3, 7, 15
 $2^n - 1$ is the pattern

b) No - all rows contain the number!

pg. 250 # 1-8

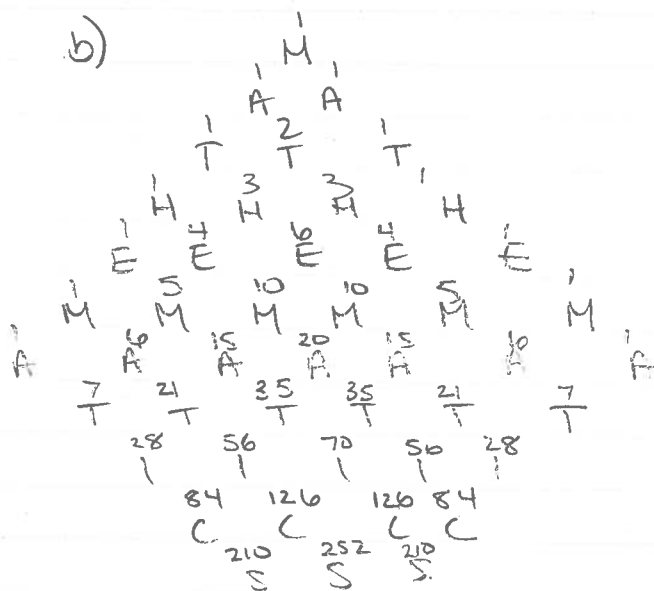
$$\begin{array}{|c|c|c|c|}
 \hline
 924 & 792 & 495 & 330 \\
 \hline
 114 & 1287 & 825 & \\
 \hline
 \end{array}$$

3003 2112

$$\begin{array}{|c|}
 \hline
 5110 \\
 \hline
 \end{array}$$

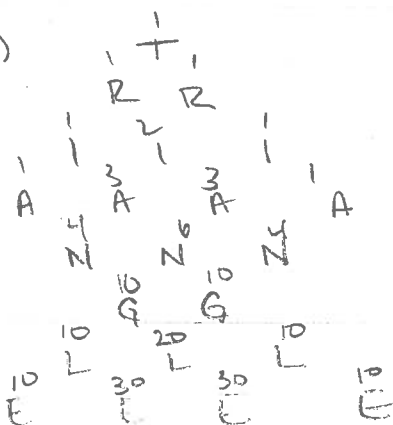
2a) 128

b)



$$252 + 210 + 210 = 672$$

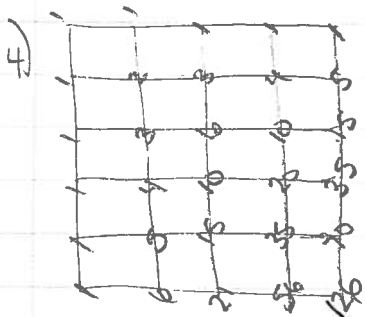
c)



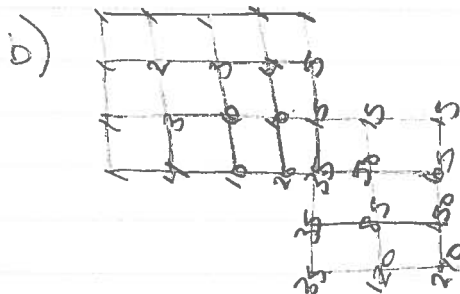
$$10 + 30 + 30 + 10 = 80$$

3)

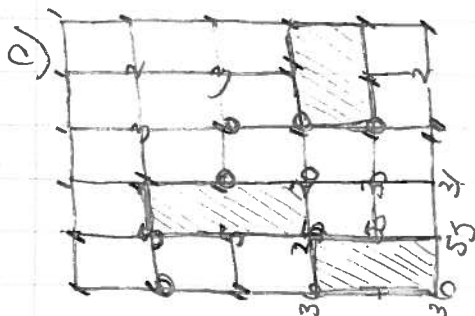
1	15	105	455	1365	3003	5005	6435	6125
1	14	120	560	1820	4368	8008	11440	12870
1	17	136	680	2380	6188	12376	19448	24310



120.



270



$$30 + 55 + 11 + 2 + 1 = 130.$$

e) $\frac{8!}{3!5!} = 56$

f) $\frac{9!}{4!5!} = 126$

- No, there are only 126 different routes he could take.

7a)

6		12	10	5			
	6		6	4	1		
3	↑	X	↑	3	1		
	3		3	X			
1		2		1			
	1		1				

$$6 + 12 + 10 + 5 = 33$$

b)

56	95	101	98	72	45	18	5
25	31	39	31	28	13	4	1
9	16	X	16	9	3	1	
3	6	7	6	3	X		
1	2	3	2	1			
	1	1	1				

$$56 + 95 + 101 + 98 + 72 + 45 + 18 + 5 = 490$$

5	9	5	1
5	4	1	
2	3	1	
2	1		
1			
1			
1			

b) The square labelled 3 (it is the most "central" and therefore has the most options of movement).