ALG HW

(3)

1: 1/8
2: 1/8
3: 2/8
4: 1/8
5: 3/8

	1	2	3	4	S
1	1	1	2	1	3
2	1	1	2	1	3
3	2	2	4	2	6
4	1	1	2	1	3
5	3	3	6	3	9

all over 64

(4)

To win →	d_1	d_2	d_3	d_4
d_1	X	14/36	1/2	24/36
d_2	22/36	X	14/36	20/36
d_3	1/2	22/36	X	12/36
d_4	12/36	16/36	24/36	X

d1: 1, 2, 3, 9, 10, 11
d2: 0, 1, 7, 8, 8, 9
d3: 5, 5, 6, 6, 7, 7
d4: 3, 4, 4, 5, 11, 12

X

D_1: 10 or 11: 2/6 to roll 6/6 to win

D_2: 9: 1/6 to roll 5/6 to win 1/6 to tie
3: 1/6 to roll 2/6 to win 4/6 to loose
2: 1/6 to roll 2/6 to win 4/6 to loose
1: 1/6 to roll 1/6 to win

$\frac{12}{36} + \frac{5}{36} + \frac{2}{36} + \frac{2}{36} + \frac{1}{36}$ $\frac{22}{36}$ for D_1

$\frac{14}{36}$ for D_2

d1: 1, 2, 3, 9, 10, 11
d2: 0, 1, 7, 8, 8, 9
d3: 5, 5, 6, 6, 7, 7
d4: 3, 4, 4, 5, 11, 12

D_1: 3: $\frac{3}{6}$ $\frac{6}{6}$
v 3: $\frac{3}{6}$ $\frac{0}{6}$
D_3

$\frac{18}{36}$ = D_1 TO WIN
$\frac{18}{36}$ = D_2 TO WIN

D_1: 11: $\frac{1}{6}$ $\frac{4}{6}$
~ 10: $\frac{1}{6}$ $\frac{4}{6}$
D_4 9: $\frac{1}{6}$ $\frac{4}{6}$
: $\frac{3}{6}$ $\frac{0}{6}$

$\frac{12}{36}$ D_1 TO WIN
$\frac{24}{36}$

v. D_2: 9, 8, 8: $\frac{3}{6}$ $\frac{6}{6}$
D_3 7: $\frac{1}{6}$ $\frac{4}{6}$

D_2 $\frac{22}{36}$
D_3 $\frac{14}{36}$

D_2: 9: $\frac{1}{6}$ $\frac{4}{6}$ $\frac{16}{36}$ D_2 TO WIN
v D_4 8: $\frac{2}{6}$ $\frac{4}{6}$ $\frac{20}{36}$ D_4 TO WIN
7: $\frac{1}{6}$ $\frac{4}{6}$
1: $\frac{2}{6}$ $\frac{6}{6}$

D_3: 11, 12: $\frac{2}{6}$ $\frac{6}{6}$ D_3 TO WIN $\frac{12}{36}$
v D_4: [illegible]S+: $\frac{4}{6}$ $\frac{0}{6}$ D_4 TO WIN $\frac{24}{36}$

(7) a) $\sum_{j=1}^{N} (3i+7) = \frac{N(N+1)}{2} + 7N = \frac{N^2+15N}{2}$

B) $\sum_{i=1}^{N} (i^2-2i) = \sum_{i=1}^{N} i^2 - 2\sum_{i=1}^{N} i$

$= \frac{2N^3+3N^2+N}{6} - 2\left(\frac{N(N+1)}{2}\right)$

$= \frac{2N^3+3N^2+N}{6} - \frac{12N^2+12N}{6}$

$= \frac{2N^3-3N^2-5N}{6}$

C) $\sum_{i=7}^{N} (i) = \frac{N(N+1)}{2} - \frac{49}{2}$

D) $\sum_{i=5}^{N} (i^2+1) = \sum_{i=5}^{N} i^2 + \sum 1$

$= \left(\frac{2N^3+3N^2+N}{6} - \sum_{i=0}^{5} i^2\right) + \left(N - \sum_{i=0}^{5} i^2\right)$

E) $\sum_{i=1}^{N} (6^i) = \frac{6^{N+1}-1}{6-1}$

f) $\sum_{i=7}^{N} (4^i) = \frac{4^{N+1}-1}{4-1} - \frac{4^{7+1}-1}{4-1}$

BECAUSE

$\sum_{i=7}^{N} (4^i) = \sum_{i=0}^{N} (4^i) - \sum_{i=0}^{7} (4^i)$