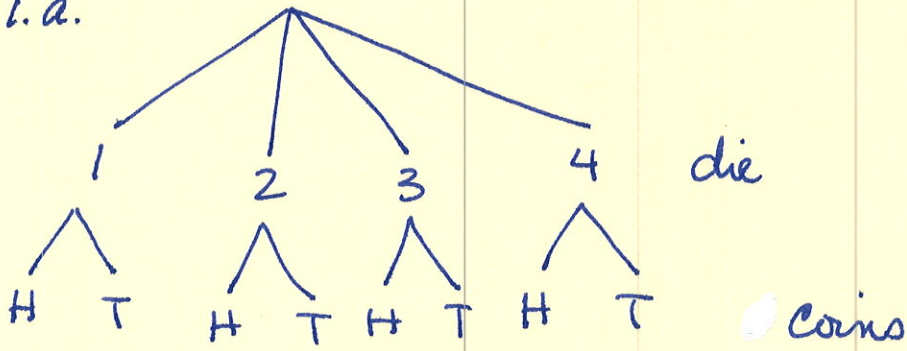


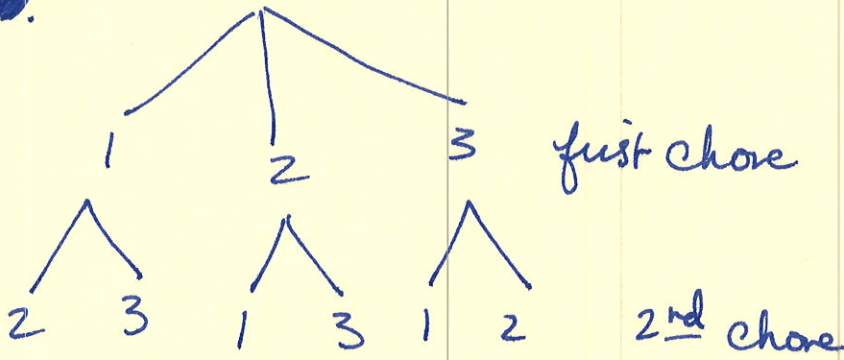
MAT 100 Homework #7 Key

1.a.



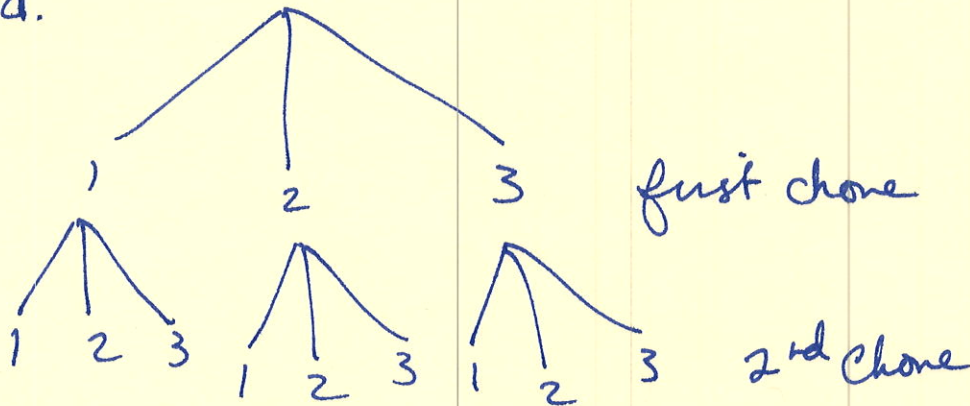
Sample space has 8 elements (2×4)

c.



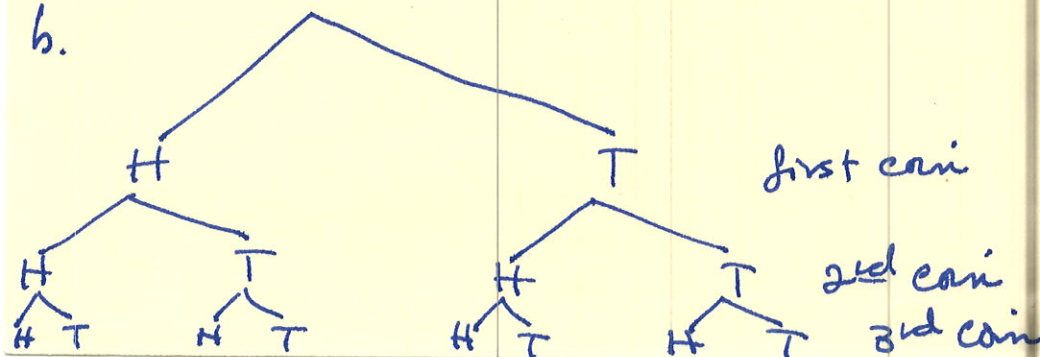
Sample space has 6 elements (3×2)

d.

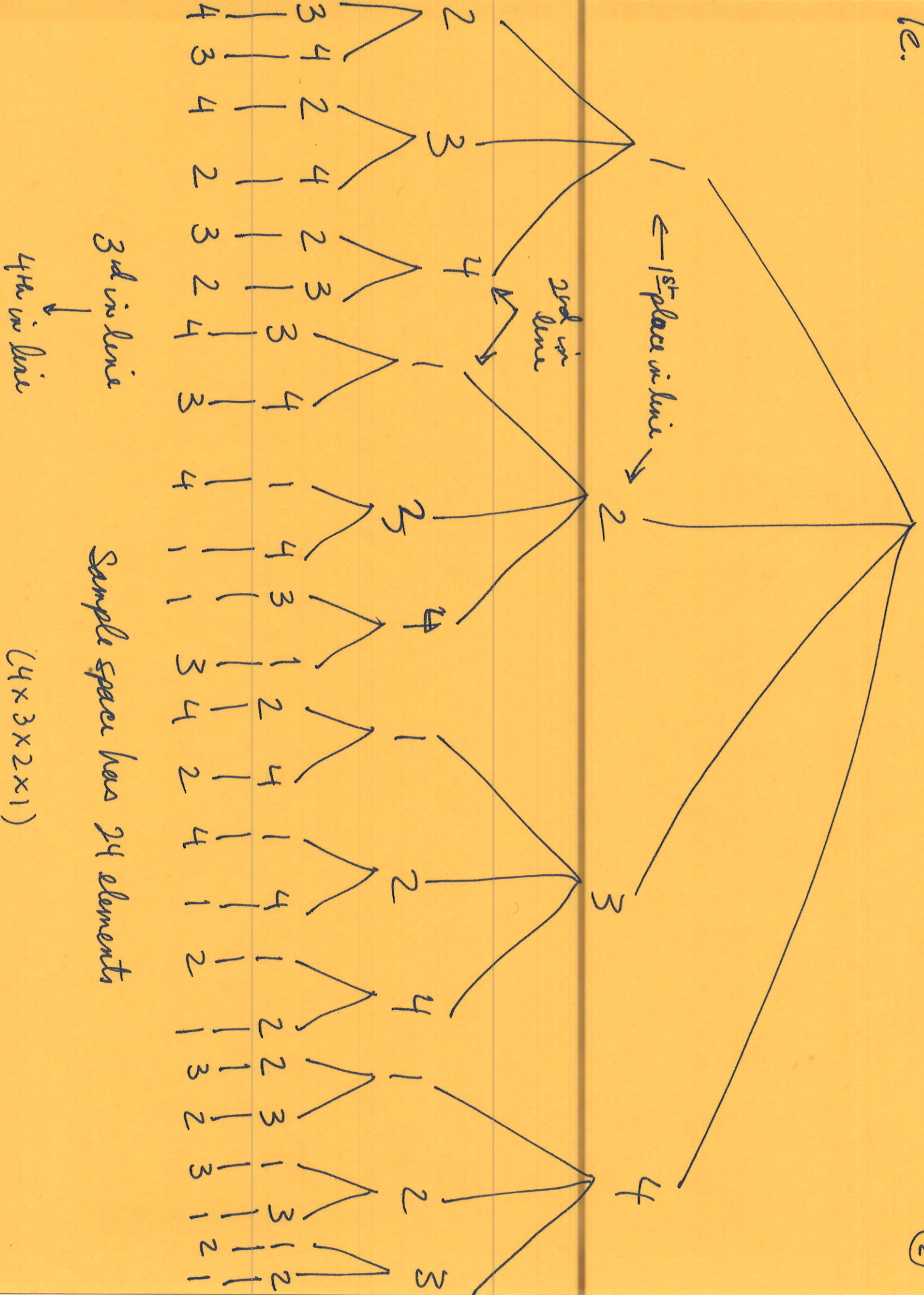


Sample space has 9 elements (3×3)

b.



Sample space has 8 elements $(2 \times 2 \times 2)$



w/ Jokers

2a. $52C3 = 22,100$

$54C3 = 24,804$

b. $6^5 = 7776$

c. $26^4 = 456,976$

d. $5^4 = 625$
w/rep

$5P4 = 120$
w/o rep

e. $(12! = 479,001,600)$

f. $26^3 \cdot 10^4 = 17,576,000$

g. $36^9 = 1.0156 \times 10^{14}$

h. $26+26+10+32 = 94$

$94^8 = 6.096 \times 10^{15}$

$94^{13} = 4.4737 \times 10^{25}$

i. $2 \times 3 \times 8 \times 2 = 96$

j. $5C1 + 5C2 + 5C3 + 5C4 + 5C5 =$
 $5 + 10 + 10 + 5 + 1 = 31$

k. $210P3 = 9,129,120$

l. $210C3 = 1,521,520$

3. a i. $\frac{5}{26}$

ii. $\frac{21}{26}$

iii. $\frac{5}{26} * \frac{21}{25} * \frac{4}{24} = \frac{7}{260}$ (w/o replacement)

b. $\frac{1}{6}$

f. $\frac{1}{6} \cdot \frac{1}{6} = \frac{1}{36}$

c. $\frac{1}{20}$

g. $\frac{7}{36}$

d. $\frac{1}{12}$

e. $\frac{2}{6}$

- 3h. i. $26/65$
- ii. $4/65$
- iii. $18/65$

i. $8/52$

j. $\frac{4}{52} \cdot \frac{4}{51} = \frac{16}{2652} = \frac{4}{663}$

k. $\frac{1}{52} \cdot \frac{1}{51} = \frac{1}{2652}$ won't happen $1 - \frac{1}{2652} = \frac{2651}{2652}$

l. 0 since there are no red ones

$\frac{14}{32} \cdot \frac{13}{31} = \frac{91}{496}$

4.

\$3	0	-1
$\frac{1}{6}$	$\frac{1}{6}$	$\frac{4}{6}$

$3 * \frac{1}{6} + 0 * \frac{1}{6} - 1 * \frac{4}{6} = \frac{3}{6} - \frac{4}{6} = -\frac{1}{6}$

no, don't play the game; it is not fair

5. $\frac{1}{2306} * 30,000 - \$1 * (1 - \frac{1}{2306}) = -.7028$

6. answers will vary

7. a. $\frac{2}{7+2} = \frac{2}{9}$

b. $\frac{3}{5+3} = \frac{3}{8}$

8. a. for 3:4

b. for 9:2

9. a. dependent

b. dependent

c. dependent

d. independent

10. a. $10/20 = 1/2$

b. $11/20$

c. $8/20$

d. $\frac{1}{2} \cdot \frac{11}{20} = \frac{11}{40} \neq \frac{8}{20}$

e. they are dependent

11. expected value is 0 if game is fair

12. Classical based on equally likely events $\frac{\# \text{ in event}}{\# \text{ in sample space}}$

experimental based on collecting data from trials

Subjective personal best guess

13. $0 \times 0.07 + 1 \times 0.13 + 2 \times 0.18 + 3 \times 0.30 + 4 \times 0.22 + 5 \times 0.08 + 6 \times 0.02 = 2.79$

14. a. 8.718×10^{10}

b. 1,663,200

c. 1.0897×10^{10}

d. 990

e. 245,157

f. 45

15.

x	990	190	40	0	-10
P(x)	$\frac{1}{250}$	$\frac{1}{250}$	$\frac{1}{250}$	$\frac{4}{250}$	$\frac{243}{250}$

$990 \times \frac{1}{250} + 190 \times \frac{1}{250} + 40 \times \frac{1}{250} + 0 \times \frac{4}{250} - 10 \times \frac{243}{250} = -4.84$

16.

x	999,750	9750	250	-250
P(x)	.0001	.005	.03	.9649

$999750 \times (.0001) + 9750 (.005) + 250 (.03) + (-250) (.9649) = -85$