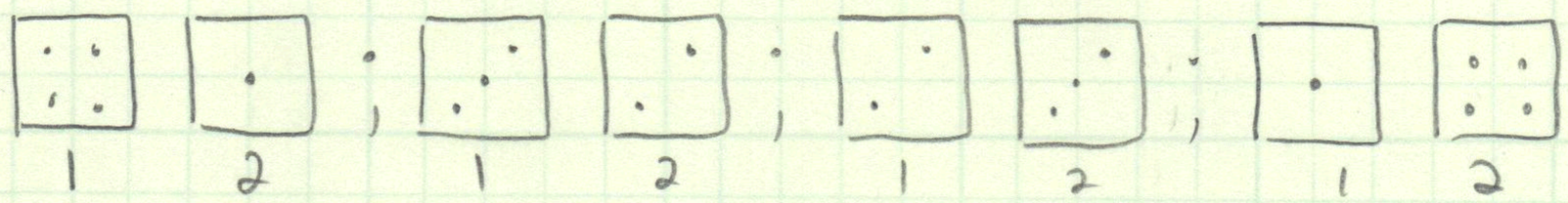
Chapter 14 Exercise Set A

1 

4/36.

2

	1	2	3	4	5
1	1 1	2 1	3 1	4 1	5 1 ✓
2	1 2	2 2	3 2	4 2 ✓	5 2
3	1 3	2 3	3 3 ✓	4 3	5 3
4	1 4	2 4 ✓	3 4	4 4	5 4
5	1 5 ✓	2 5	3 5	4 5	5 5

5/25

3 7 appears most often. $^{6}/_{36}$ chance each time.

1 & 12 appear least often $^{1}/_{36}$ chance each time.

4a $\frac{2}{4}$

4b $\frac{2}{6}$

4c $\frac{3}{6}$

Chapter 14 Exercise Set B

1 False, there could have been extra hungry kids who had cookies and ice cream. These two things are not mutually exclusive.

2a 4/20

2b 8/20

2c 12/20

2d Bad use of "At least" just so you know. Be inside A or B or C.

14/20.

3 They are the same.

4 False. Adding these two fractions counts 1 2 twice.

5 False. For any draw the chance to get a 7 are 1 out of 10. These events are not mutually exclusive which means we are double counting some things.

6 True, these things are mutually exclusive.

Chapter 14 Exercise Set C

1a $\frac{1}{52}$

1b $\frac{1}{52}$

1c They could.

1d False, the chance of going is $\frac{1}{52} + \frac{1}{52} - \left(\frac{1}{52} \times \frac{1}{51}\right)$
The events are not mutually exclusive.

2a $\frac{1}{52}$

2b $\frac{1}{52}$

2c No, if the ace of hearts is the first card, it can't be the second and vice versa.

2d True, these events are mutually exclusive.

3a True.

3b True.

3c False, not mutually exclusive.

3d True, mutually exclusive.

3e False, These two events are Dependent on one another.

3f False, the Jack of clubs can't be in two places at once.

4a False, they could be dependent on each other.

4b True.

4c False, Mutually Exclusive ≠ Independence.

4d False, They may not be mutually exclusive so this is wrong to apply.

4e False. If they are independent they could still happen together.

4f True.

5a $\frac{4}{52}$

5b $\frac{4}{51}$

5c $\frac{4}{52} \times \frac{4}{51}$

Chapter 14 Exercise Set D

1 a) (i)

b) (i)(ii)

c) (iii)

d) (ii)(iii)

e) (i)(ii)

f) (i)

2 a and f are the same.
b and e are the same.
c and d are different.

3a $\frac{3}{4}$

3b $\frac{3}{4}$

3c w/ replacement $\frac{3}{4} \times \frac{3}{4}$

3d Same as getting blanks. $\frac{3}{4} \times \frac{3}{4}$

3e 1 - no stars. $1-\left(\frac{3}{4} \times \frac{3}{4}\right)$

4a 1 - no aces $1-\left(\frac{5}{6} \times \frac{5}{6} \times \frac{5}{6}\right)$

4b 1 - no aces $1-\left(\frac{5}{6}\right)^6$

4c 1 - no aces $1-\left(\frac{5}{6}\right)^{12}$

5 1 - no double aces. $1-\left(\frac{35}{36}\right)^{36}$

6 The throws are independent. There is one 17

The chance of never getting a seventeen is easier to compute.

$$\left(\frac{31}{32}\right)^{22} = 49.7\%$$

So getting a 17 is $100 - 49.7 = 50.3\%$.

7 The chance of being shot down is 2% or $\frac{2}{100}$
The chance of surviving is 98/100 on any given mission.

So let's compute $\left(\frac{98}{100}\right)^{50 \text{ independent missions}} = 36.4\%$.

So the chance of being shot down is $100 - 36.4 = 63.6\%$

Chapter 14 Review Exercises

1a $\frac{1}{6} \times \frac{1}{6}$

1b $\left(\frac{1}{6} \times \frac{1}{6}\right) + \left(\frac{1}{6} \times \frac{1}{6}\right) + \left(\frac{1}{6} \times \frac{1}{6}\right) + \left(\frac{1}{6} \times \frac{1}{6}\right) + \left(\frac{1}{6} \times \frac{1}{6}\right) + \left(\frac{1}{6} \times \frac{1}{6}\right)$

both 1's both 2's . . . . . .

2 $\frac{2}{36}$; see figure 1.

3a False. 1 - no ace $1-\left(\frac{5}{6}\right)^3$ Not Mutually Exclusive

3b False 1 - no head $1-\left(\frac{1}{2}\right)^2$ Not Mutually Exclusive.

4 i - chance of winning since they are mutually exclusive is 2/52
ii - chance of winning is 1/52.

option 1 is better.

5 a) False, A and B still can happen together.

b) True, If one happens the other can't so they are dependent.

6 If you want to find the chance that <u>at least one of the two events</u> will happen, check to see if they are <u>mutually exclusive</u> and then <u>add</u> the chances.

If you want to find the chance that <u>both events</u> will happen, check to see if they are <u>independent</u> and then <u>multiply</u> the chances

7 1 - no 2ever

$$1-\left(\frac{3}{5}\right)^4$$

8 The two has to be drawn because 4 tickets are drawn without replacement. So 100%.

9 Possible outcomes.

		B 1	2	3	4
	1	11	21	31	41
A	2	12	22	32	42
	3	13	23	33	43

a) 3/12

b) 3/12

c) 6/12

10 ii is better because there is a $\frac{3}{6}$ chance of winning each time rather than the $\frac{2}{6}$ chance with option 1.

11a $\frac{13}{52} \times \frac{12}{51} \times \frac{11}{50}$

11b $\frac{39}{52} \times \frac{38}{51} \times \frac{37}{50}$

11c 1 - chance of getting all diamonds. $1 - \left(\frac{13}{52} \times \frac{12}{51} \times \frac{11}{50}\right)$

12a True. $\left(\frac{1}{2}\right)^{10} = 1/1,024$

12b True, they are independent.

13 Trial and error. at least one red = 1 - no red.

$(.98)^x > 50$. Try different values for x.

35 is the answer.

14 The chances are the same because each ticket has an independent chance of winning. One ticket doesn't affect another.