Parnell College
Probability Revision

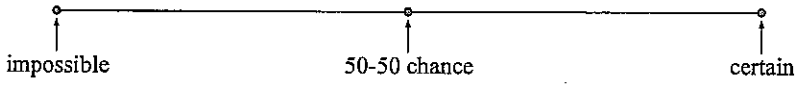
1 Use words such as certain, highly likely, likely, 50-50 chance, unlikely, highly unlikely and impossible, to describe the chance of the following happening:

a There will be snow on Mount Cook all year round.

b Mt Ruapehu will erupt tomorrow.

c Some of the Cook Strait ferry services will be cancelled in winter due to bad weather.

2 Copy the number line and add the following words to it using arrows where necessary: *seldom, good chance, almost certain*



3 A bag contains 40 apples of which 39 are red and one is green.
An apple is randomly chosen from the bag.

a Is it more likely that the apple is red than green?

b Is it certain that the apple will not be green?

c True or false: There is a 1 in 39 chance that the apple is green.

4 A box contains 3 red tickets and 3 blue tickets. One ticket is taken from it at random. What is the probability of selecting:

a a red ticket

b a red or a blue ticket

c a yellow ticket?

5 A bag contains 7 caramels and 7 chocolates. A sweet is randomly selected from it.

a What is the probability of selecting:

i a chocolate **ii** a caramel?

b If all the chocolates are eaten, what is the probability of selecting a chocolate?

6 A cube has four faces painted purple and two painted pink. When the cube is rolled, what is the probability that the uppermost face is:

a purple **b** pink **c** black?

7 A die is rolled. What is the probability of getting:

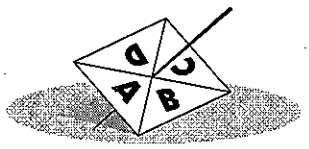
a a 2 **b** an even number **c** a number greater than 4?

8 A square spinner has A, B, C or D on its equal sides.
After one spin, what is the probability of getting:

a a B or a D

b a vowel

c an S?

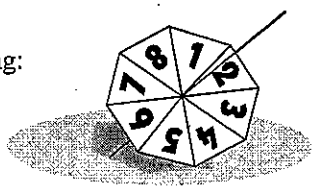


9 Consider the illustrated spinner (a regular octagon).
If the spinner is spun once, find the probability of getting:

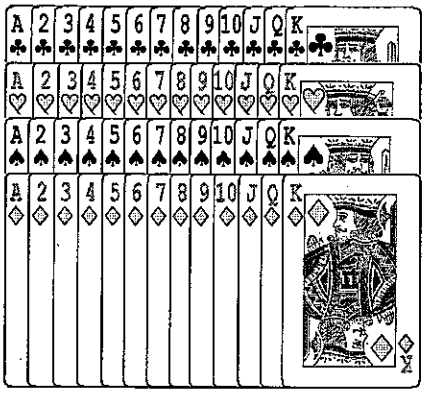
a a 2 or a 4

b a number greater than 8

c a number less than 8.



10 This illustration shows a full pack of playing cards. For this exercise, the pack is well shuffled and placed face down. Hearts and diamonds are red, spades and clubs are black. Jacks, Queens and Kings are called picture cards. Eli picks one card at random from the shuffled pack.



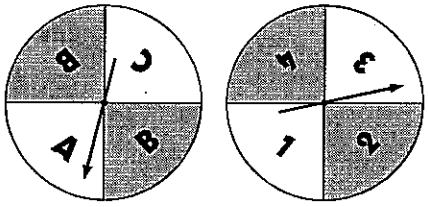
Find the chance of getting:

- **a** a spade ♠
- **b** an ace
- **c** a King or a Queen
- **d** a black Jack

11 A coin is tossed and a die is rolled at the same time. One possible result is 'a head with the coin and a 5 with the die', and this result could be represented by H5.

- **a** Using this shorthand notation, list the possible results from this experiment.
- **b** How many different results are possible from one performance of this experiment?
- **c** Find the probability of getting T1, T3 or T5.

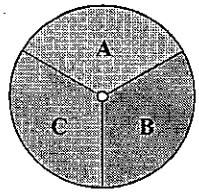
12 The two illustrated spinners are twirled together. One possible result is **A3**, 'an **A** with the first spinner and a **3** with the second'. This result is shown.



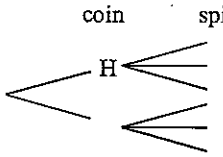
Find the probability of getting:

- **a** **A1**
- **b** an **A** and an odd number
- **c** a **B** and a **1**

13



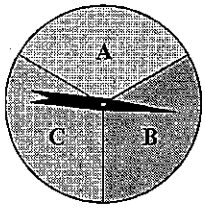
Draw a tree diagram to show all the possible outcomes when a coin is tossed and the spinner shown is spun.



Use a tree diagram to work out the probability that:

- **a** a head and an A results
- **b** a tail and a B or a C results
- **c** an A is in the outcome.

14 The following spinner is spun two times with the letter recorded each time.



- **a** Draw a tree diagram and list all possible outcomes.
- **b** Use the tree diagram to work out the probability of:
  - **i** two As
  - **ii** B followed by C
  - **iii** one outcome is an A and the other is a B.

Parnell College
Algebra Revision

1 Write down the missing number from the following pattern:
13, 26, 39, □, 65

2 Write down the missing number from the following pattern:
□, 106, 99, 92, 85

3 Write down the missing number from the following pattern:
45, 40.5, □, 31.5, 27

4 Write down the missing number from the following pattern:
18, □, 36, 45, 54

5 Write down the missing number from the following pattern:
800 000, 40 000, □, 100, 5

6 Write down the missing number from the following pattern:
1, 2, 6, 24, □

7 You are given the rule:
"The number of matchsticks is three times the unit number plus two."

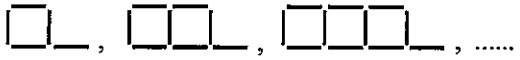
a Rewrite the rule using variables and state what each symbol means.

b Make up a matchstick pattern that shows the rule.

8 You are given the rule:
"The number of matchsticks is twice the unit number plus one."

a Rewrite the rule using variables and state what each symbol means.

b Make up a matchstick pattern that shows the rule.

9 Examine the matchstick pattern: 

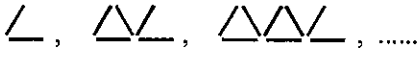
a Copy the pattern and add to it the next three members.

b Copy and complete:

Unit number (n)	1	2	3	4	5	6
Matchsticks needed (M)						

c Find the rule connecting M and n.

d Find the number of matchsticks needed to make the 17th member.

10 Examine the matchstick pattern: 

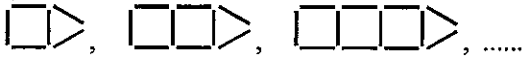
a Copy the pattern and add to it the next three members.

b Copy and complete:

Unit number (n)	1	2	3	4	5	6
Matchsticks needed (M)						

c Find the rule connecting M and n.

d Find the number of matchsticks needed to make the 32nd member.

11 Examine the matchstick pattern: 

a Copy the pattern and add to it the next three members.

b Copy and complete:

Unit number (n)	1	2	3	4	5	6
Matchsticks needed (M)						

c Find the rule connecting M and n.

d Find the number of matchsticks needed to make the 59th member.

12 Find the rule connecting M and n in the table.

Then find M when $n = 495$.

n	1	2	3	4	5
M	4	6	8	10	12

13 Find the rule connecting M and n in the table.

Then find M when $n = 37$.

n	1	2	3	4	5
M	8	14	20	26	32

14 Find the rule connecting M and n in the table.

Then find M when $n = 121$.

n	1	2	3	4	5
M	8	19	30	41	52

15 Find the rule connecting M and n in the table.

Then find M when $n = 441$.

n	1	2	3	4	5
M	6	10	14	18	22

16 A rescue helicopter organisation charges a callout fee of \$1800 plus \$800 per hour of usage. If the total charge is $\$C$ for n hours usage, find:

- **a** the formula connecting C and n
- **b** the total charge for a callout lasting 5 hours.

17 Solve the following equations, that is, find the numbers that replace the letters:

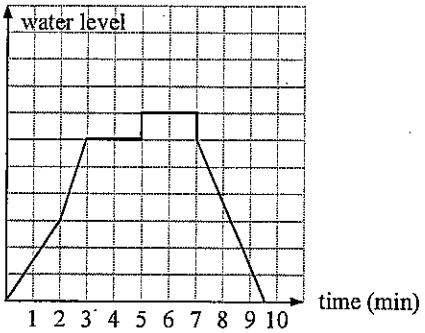
a $7 + s = 18$ **b** $2 \times m - 4 = 12$

18 Solve the following equations, that is, find the numbers that replace the letters:

a $3 + m = 14$ **b** $f \times 7 - 5 = 51$

19 The graph shows the water level of a spa bath. What do you think happened at the:

- **a** 2-minute
- **b** 3-minute
- **c** 5-minute
- **d** 7-minute mark?



20 The graph shows the progress of a boy cycling to school.

- **a** It is known that he crosses an intersection where there are traffic lights. How long was he delayed at the lights?
- **b** It is also known that there is a hill on the journey. When did the boy reach the top of the hill?