

Probability basics

Name

<p>1. Define probability.</p> <p>2. Define relative frequency.</p> <p>3. Complete the following: A relative frequency can be found by collecting and this can be used as an approximation of the probability. The more data, the more the approximation. The data may already exist or we may produce it by performing an consisting of a number of The set of all possible outcomes is called the We can use symmetry to calculate probabilities if</p>	<p>4. Can we use symmetry in the following situations? a) We want to find the probability that a matchbox will land on its end. b) We want to find the probability that a coin will land heads up. c) We want to find the probability that the next animal Mr Canis sees is a rabbit. d) We want to find the probability that Teresa's first child is a girl.</p> <p>5. Give the probabilities for the situations in Q4 where symmetry can be used.</p> <p>6. Use symmetry to find the following probabilities. a) Getting a head when you toss a coin b) Getting a 3 when you roll a die c) Picking the 4 of hearts from a pack of 52 cards d) Picking an ace from a pack of 52 cards e) Getting a girl when you have a baby.</p>
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Revision Sheet 3C5

Name

1. A matchbox is dropped. It might land flat, on its edge or on an end. Put these three outcomes in order from most likely to least likely.

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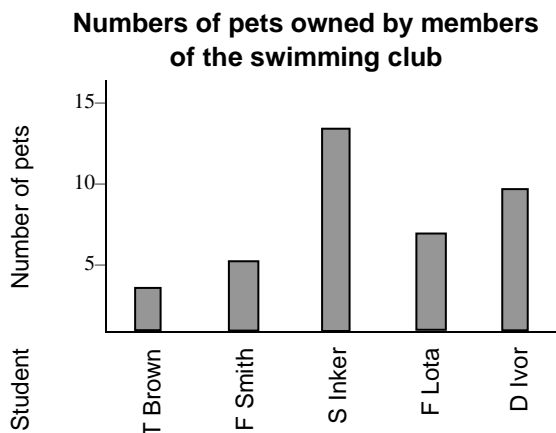
2. Use the following table to find the area of a square with side length 6 m.

Side length (m)	0	1	2	3	4	5	6	7
Area (m ²)	0	1	4	9	6	25	36	49

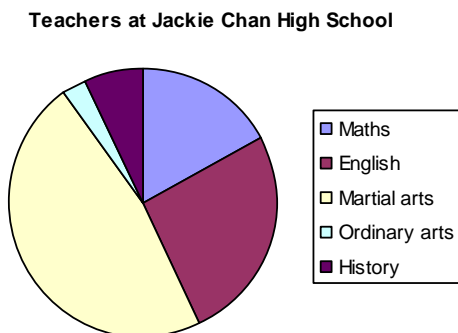
3. The following table shows the numbers of hours homework done in the last week by students in 8F. Present this data as a picture graph in the space below. (7Cb)

Student	Hours
Dee Klein	5
Barb Dwyer	12
Dwayne Pipe	8
Evan Zabuv	17
Ron Peters	0
Ellie Mentery	10

4. Use the bar graph below to find how many pets D Ivor has



5. Use the pie graph below to estimate what percentage of the teachers are History teachers.



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Revision Sheet 3C6

Name

1. A standard pack of 52 cards contains 13 hearts, 13 diamonds, 13 spades and 13 clubs. You shuffle them and then pick one without looking. You might get a heart, a diamond, a spade or a club. List these 4 outcomes in order from most likely to least likely.
2. The following table shows the numbers of hours homework done in the last week by students in 8F. Present this data as a bar graph in the space below.

Student	Hours
Dee Klein	5
Barb Dwyer	12
Dwayne Pipe	8
Evan Zabuv	17
Ron Peters	0
Ellie Mentery	10

3. Present the data in the table below as a line graph. Draw the line as a smooth curve through the points.

Diameter (m)	Area (m ²)
0	0
1	0.8
2	3.1
3	7.1
4	12.6
5	19.6

4. Use the line graph from the last question to find the area of a circle with diameter 3.5 m.

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5. Plot this table of score on the test vs hours spent on homework as a scatter graph:

Hours	Score
4	51
13	88
7	70
1	21
10	90
7	51

6. In an election
 - 35% of voters voted for the Liberals,
 - 27% voted for the Nationals,
 - 11% voted for the Democrats,
 - 27% voted for the Anarchists.

Present this data as an approximate pie chart in the space to the right.

Revision Sheet 3C7

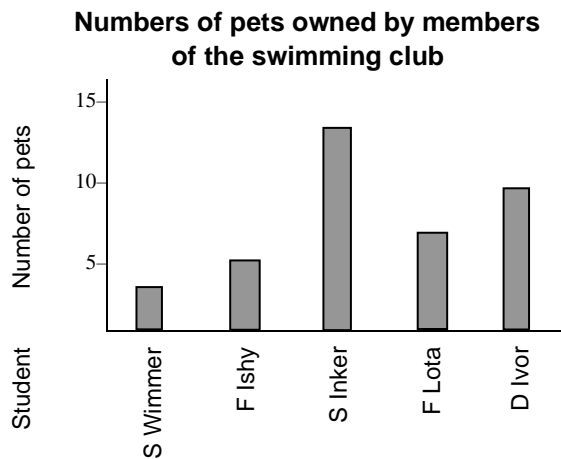
Name

- The maximum temperature on Dec 23 this year could be 5°, 15°, 25°, 35°, 45° or 55°. List these in order from most likely to least likely.

- The following table shows the numbers of hours homework done in the last week by students in 8F. Present this data as a dot plot in the space below.

Student	Hours
Dee Klein	5
Barb Dwyer	12
Dwayne Pipe	8
Evan Zabuv	17
Ron Peters	0
Ellie Mentery	10

- Put the information in the bar graph below into a table.



- Present the information in the last question as an approximate pie chart.

- On the back of this sheet, design a data record template for a survey to answer the question: “What is the most popular school subject in Year 8 at your school?” Explain how you would use it to answer the question.

Revision Sheet 3C8

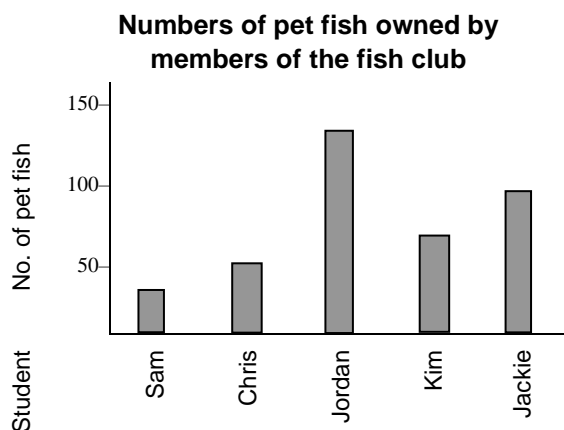
Name

1. Grandma falls off the bed. List 4 possible outcomes in order from most likely to least likely.

2. Use the following table to find which house has the most dogs.

Street number	26	28	30	32	34	36	38	40
Number of dogs	0	2	1	17	1	0	5	3

3. Redraw the data below as a picture graph. (7Cb)



4. Present the data in the table below as a line graph. Draw the line as a smooth curve through the points.

Mass (g)	Cost (\$)
0.5	40
1	70
2	120
3	170
5	240
10	300

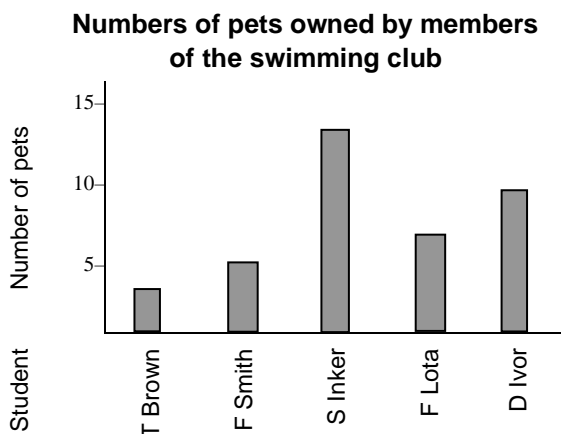
5. Use the line graph in the last question to find the cost if the mass is 4 g.

6. Plot this table of score on the test vs hours spent on homework as a scatter graph:

Hours	Score
4	51
13	88
7	70
1	21
10	90
7	51

Show working on the back of the sheet for the questions marked with a *.

6. Present the data in the bar graph below as an approximate pie chart.



7. What is probability?

8. Give the approximate probabilities of the following:

- (a) That the next square you see will have 4 sides
- (b) That you would get a 5 if you rolled a die

9. Carol looked up rainfall records to find the probabilities of rain on her birthday, January 12. She found that in the past 26 years it had rained 15 times on January 12.

- (a) What is the probability that it will rain on her birthday?
- (b) Did Carol use experimental data or pre-existing data to work out the probabilities?
.
- (c) * How many of Carol's next 60 birthdays are likely to be wet?

10. For each of the following situations, say whether symmetry can be used to find the probability we are after or whether we would have to collect data. If there is symmetry, work out the probability wanted.

- (a) A student throws her maths book at the teacher from the other side of the classroom. The book might hit the teacher or it might miss.
We want to know the probability that it will score a hit.
- (b) A standard pack of 52 playing cards is shuffled, then someone picks a card without looking. We want to know the probability that they will get the Ace of Hearts.

11. * Find the mean, median, mode and range of these numbers: 5, 11, 14, 8, 7, 8, 6, 12, 29, 10

Mean Median Mode Range

Revision Sheet 3C10

Name

Show working on the back of the sheet for the questions marked with a *.

- 1. Give the approximate probability that it will rain on April 30 next year
- 2. When dropped 100 times, a bent coin landed heads up 64 times.
What is the probability that it will land tails up on the next drop?
- 3. A regular dodecahedron has each face painted a different colour.
If you roll it, what is the probability that the black face will land upwards?
- 4. What is the probability of getting a prime number if you roll a 6-faced die?
- 5. For a matchbox, the probability that it will land flat is 78%. The probability that it will land on an edge is 18%. What is the probability that it will land on an end?

These are Sarah’s times in seconds for six 100 m sprints: 14.5, 13.5, 14, 12.5, 14.5, 15

- 6. Find the mean
- 7. Find the range

The following are the annual water usages in kL of houses in Carrot Street:

352, 278, 290, 409, 228, 383, 277, 414, 365, 378, 259, 168, 317, 299, 443, 400, 274, 376, 330, 291, 351, 305, 545, 328, 251, 217, 269, 383, 310.

- 8. Put this data into a grouped table using groups 151-200, 201-250 etc.

- 9. Present the data as a histogram using the same groupings.

The following are speeds (in km/h) of a sample of vehicles passing Nutbush police station:

38, 58, 44, 59, 55, 71, 52, 31, 47, 20, 42, 55, 9, 21, 47, 51, 18, 33, 50, 53, 44, 57, 50, 29, 34, 41

- 10. Present this data as a stem-and-leaf plot.

Revision Sheet 3C10 Answers

Show working on the back of the sheet for the questions marked with a *.

1. Give the approximate probability that it will rain on April 30 next year ... **0.1-0.5** ...
2. When dropped 100 times, a bent coin landed heads up 64 times.
What is the probability that it will land tails up on the next drop? **0.36**
3. A regular dodecahedron has each face painted a different colour.
If you roll it, what is the probability that the black face will land upwards? .. $\frac{1}{12}$
4. What is the probability of getting a prime number if you roll a 6-faced die? $\frac{3}{6}$
5. For a matchbox, the probability that it will land flat is 78%. The probability that it will land on an edge is 18%. What is the probability that it will land on an end? ... **4%**

These are Sarah's times in seconds for six 100 m sprints: 14.5, 13.5, 14, 12.5, 14.5, 15

6. Find the mean ... **14 s**
7. Find the range ... **2.5 s**

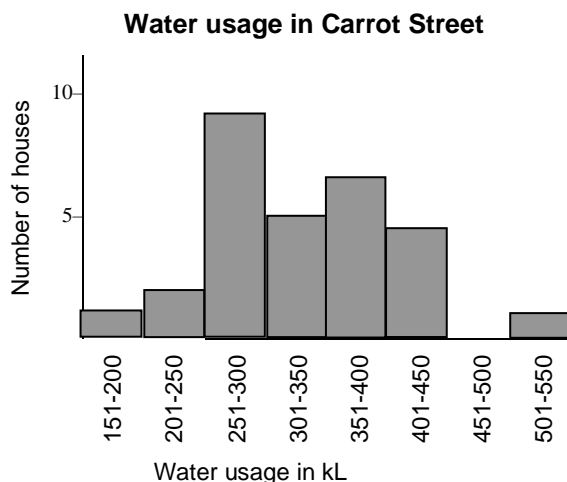
The following are the annual water usages in kL of houses in Carrot Street:

352, 278, 290, 409, 228, 383, 277, 414, 365, 378, 259, 168, 317, 299, 443, 400, 274, 376, 330, 291, 351, 305, 545, 328, 251, 217, 269, 383, 310.

8. Put this data into a grouped table using groups 151-200, 201-250 etc.

Usage	151-200	201-250	251-300	301-350	351-400	401-450	451-500	501-550
No. of houses	1	2	9	5	7	4	0	1

9. Present the data as a histogram using the same groupings.



The following are speeds (in km/h) of a sample of vehicles passing Nutbush police station:
38, 58, 44, 59, 55, 71, 52, 31, 47, 20, 42, 55, 9, 21, 47, 51, 18, 33, 50, 53, 44, 57, 50, 29, 34, 41

10. Present this data as a stem-and-leaf plot.

**Speeds (km/h) of vehicles passing
Nutmush police station**

7	1
6	
5	0 1 2 3 5 5 7 9
4	1 2 4 4 7 7
3	1 3 4 8
2	0 1 9
1	8
0	9