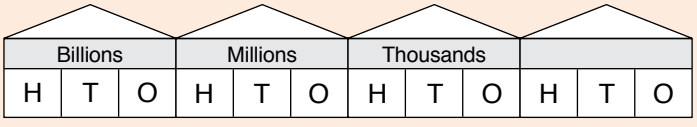
4 Large Numbers

The *Place Value Houses* shown here are helpful when we need to read or understand large numbers.



H - hundreds
T - tens
O - ones

Examples : 1 Write in figures the number fifty billion and eighty-four million.

2 a) In the number 2 475 069 what is the place value of the digit 7?
b) How do you write 2 475 069 in words?
c) How may sets of ten thousand can be made with 2 475 069?

Answers : 1 50 084 000 000

2 a) The digit 7 is the fifth digit from the right, therefore its place value is ten thousands.
b) Group the numbers from the right into groups of 3. The last 3 digits are under a thousand, the next group of 3 digits are over a thousand but under a million. We say, *two million, four hundred and seventy-five thousand and sixty-nine.*
c) Every million is made with 1000 thousands, or 100 ten thousands.
Then 2 475 069 has 247 sets of ten thousand.

A Reading and Writing Large Numbers

1 Write these numbers in figures.

a) One million, two hundred and four thousand.

.....

b) Sixty-eight billion and forty-five thousand.

.....

2 Write down the place value of the digit 5 in these numbers.

a) 3542 .....

b) 251069 .....

c) 85900720 .....

3 Write down in words the numbers in question 2.

a) .....

.....

b) .....

.....

c) .....

.....

.....

4 Order these numbers from smallest to largest.

130900	90874	9874	132000	87400

.....

.....

B Counting

1 We are counting up in tens : 10, 20, 30, etc.
Write the number that comes after . . .

a) 5390 ..... b) 6990 .....

c) 79 900 ..... d) 124 990 .....

e) Write the number before 350 000. .....

2 We are counting up in thousands, 1000, 2000, 3000, etc
Write the number that comes . . .

a) after 229 000 .....

b) before 8 million .....

3 Write down the number which is halfway between . . .

a) 71200 and 71300 .....

b) 640 000 and 650 000 .....

c) 3 million and 4 million .....

4a) How many sets of one hundred thousand can be made with 2 693 500? .....

b) How many sets of ten million can be made with twenty-four billion? .....

5 Round the number 38 736 522 as directed.

a) to the nearest ten thousand .....

b) to the nearest hundred thousand .....

c) to the nearest ten million .....

A Factorials

In maths the exclamation mark (!) has a special meaning.
For instance, 5! (say five factorial) is a short notation for
5 x 4 x 3 x 2 x 1.

Example : Calculate a) 5! b) 6!

Working : a) $5! = 5 \times 4 \times 3 \times 2 \times 1 = 120$

b) $6! = 6 \times 5 \times 4 \times 3 \times 2 \times 1$
$= 6 \times 120 = 720$

1 Calculate.

a) 3! .....

b) 7! .....

2 Without calculating the answer, show that $\frac{7!}{7} = 6!$

.....

.....

3 Use four threes and some mathematical operations to form the numbers 0 to 15. [You may use 3^3 and 3!, but not 33.)

3 x 3 – 3 x 3 = 0

..... = 1

..... = 2

..... = 3

..... = 4

..... = 5

..... = 6

..... = 7

..... = 8

..... = 9

..... = 10

..... = 11

..... = 12

..... = 13

..... = 14

..... = 15

B Round and Round in Circles

1 A group of friends are sitting around a table.
Each girl has twice as many female friends as male friends.
Each boy has 3 times as many female friends as male friends.

How many boys and girls are sitting around the table?

.....

.....

2 Find a pair of 2 digit numbers with the following properties :

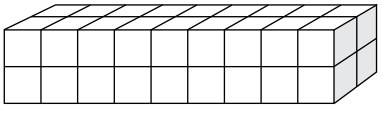
- each number equals the other when read backwards (e.g. 63 and 36)
- the square of each number equals the square of the other when read backwards

The numbers are ..... and .....

Their squares are ..... and .....

3 How many different looking cuboids can be made with 36 unit cubes?

unit cube



9 x 2 x 2 cuboid

Note that a 9 x 2 x 2 cuboid is the same as a 2 x 9 x 2 cuboid or a 2 x 2 x 9 cuboid.

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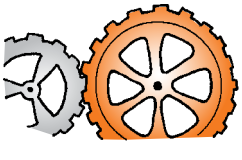
4 Gear wheel A has 24 teeth,
wheel B has 15 teeth.
If A makes 20 full turns per minute, how fast is B rotating?



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5 Amy made a large cube with unit cubes. She calculated the surface area in cm^2, then she calculated the volume in cm^3. She found it was the same number! How big is the cube?

.....

.....

26 Strategies + and −

A Mental Addition

1 Fill in the missing decimal.

a) 1.2 + ... = 5 b) 3.3 + ... = 7

c) 4.9 + ... = 6 d) 2.5 + ... = 10

e) 0.35 + ... = 1 f) 0.77 + ... = 1

g) 6.04 + ... = 8 h) 5.61 + ... = 10

i) 0.764 + ... = 8 j) 4.282 + ... = 6

Examples : Work out mentally.
a) 4.5 + 6.24 b) 5.7 + 2.8 c) 2.63 + 4.7

Possible strategies :
a) place values 4.5 + 6.24 = 4 + 6 + 0.5 + 0.24 = 10.74
b) split 5.7 + 2.8 = 5.7 + 0.3 + 2.5 = 8.5
c) add too much 2.63 + 4.7 = 2.63 + 5 − 0.3 = 7.33

2 Work these out mentally.

a) 2.3 + 5 ..... b) 6.35 + 0.5 .....

c) 5.3 + 6.8 ..... d) 4.7 + 3.9 .....

e) 16.23 + 5.5 ..... f) 23.4 + 4.8 .....

g) 32.8 + 21.7 ..... h) 25.6 + 59.6 .....

i) 4.96 + 3.8 ..... j) 9.7 + 8.84 .....

k) 19.65 + 4.5 ..... l) 23.4 + 16.92 .....

B Mental Subtraction

Examples : Work out mentally.
a) 4.1 − 1.5 b) 8.4 − 4.9
c) 43 − 28.71 d) 82.3 − 15.6

Possible strategies :
a) split 4.1 − 1.5 = 4.1 − 1.1 − 0.4 = 2.6
b) take too much 8.4 − 4.9 = 8.4 − 5 + 0.1 = 3.5
c) add on 28.71 + ***1.29*** + ***13*** = 43 Answer : 14.29
d) equal addition 82.3 − 15.6 = 86.7 − 20 = 66.7

1 Work these out mentally.

a) 5.6 − 2.5 ..... b) 8.1 − 3.4 .....

c) 24.2 − 3.9 ..... d) 7.5 − 4.6 .....

e) 6.1 − 0.75 ..... f) 100 − 54.26 .....

g) 27.3 − 2.68 ..... h) 16.85 − 3.9 .....

2 Subtract.

a) 14 − 9.853 .....

b) 26 − 11.732 .....

c) 8.2 − 0.63 .....

d) 85.26 − 24.5 .....

e) 54.4 − 32.82 .....

C Pen and Paper Strategies

Examples :
a) 795.8 + 636.57
b) 845.2 − 268.97
c) 2300 − 476.49

Working :
a) Line up the decimal points, an empty place value may be filled with a zero.

```
  795.80
+ 636.57
  1 1 1
 1432.37
```

b) Simplify the subtraction by adding 0.03 to both numbers.

```
  7 13 15
  845.23
- 269.00
  576.23
```

c) Start with 476.49 and add on to get 2300.

```
    3.51
  520.00
+ 1300.00
 1823.51
```

1 Calculate.

a) 886.45 + 573.79 b) 299.82 + 34.6 c) 4036.8 − 745.23 d) 783.24 − 429.8 e) 4300 − 586.34

A Percentage of an Amount

Example : Calculate mentally 40% of $60
Working : 40% is $\frac{4}{10}$; $\frac{4}{10}$ of $60 = 4 x $6 = $24

1 Calculate mentally.

a) 25% of 24 kg .....

b) 10% of $4.00 .....

c) 60% of 80 L .....

d) 75% of 0.8 t .....

e) $33\frac{1}{3}$ % of $84 .....

Example : Solve 15% of $..... = $42
Working : Read, *Fifteen percent of an amount of money is $45.* What is the amount?
If 15% is $42, then 5% is $14 and 100% is 20 times as much.
20 x $14 = $280
Answer : 15% of $..280... = $42

2 Solve.

a) 10% of $..... = $24

b) 75% of ..... g = 36 g

c) 40% of ..... L = 8 L

3 Electricity company '*e*-Com' wrote this advertisement :

75% of the households in Grey Bay are *e*-Com customers. Join us now!

If 1800 households in Grey Bay are with *e*-Com, how many households are there in Grey Bay?

.....

.....

.....

.....

4 In a school with 940 students, 80% were born in New Zealand. How many students in this school were born in a place other than New Zealand?

.....

.....

.....

B And Again With Feeling

Example : Use a calculator to find 35% of 112 L.
Working : 35% = 0.35, of is keyed in as [x]
[0.35] [x] [112] [=] 39.2 Answer : 39.2 L

1 Calculate with a calculator.

a) 12% of $45 .....

b) 85% of 16 L .....

c) 3% of 950 mL .....

d) 68% of 5 tonne .....

Example : Solve 82% of ..... L = 36 L
Working : If 82% is 36 L, then 1% is $\frac{36}{82}$ L
and 100% is [100] [x] [36] [÷] [82] [=] 43.9
Answer : 82% of ...43.9... L = 36 L

2 Solve.

a) 6% of $..... = $22.80

b) 35% of ..... g = 154 g

c) 18% of ..... m = 3.78 m

d) 85% of $..... = $416.50

3 A sailor must cut off 4% of a rope because it is frayed. The rope used to be 22.5 m long. How long is the rope after the frayed end is cut off?

.....

.....

.....

.....

4 Every morning William spends 21 minutes stuck in traffic jams. William says *"In the morning 37.5% of my travel time to work is spent in traffic jams."*
What is William's travelling time to work in the morning?

.....

.....

.....

.....

48 Simplifying Divisions

A Check!

We can check the answer to a division by doing a multiplication.

Examples : $30 \div 5 = 6$, check $6 \times 5 = 30$

$\frac{27}{-3} = -9$, check $-9 \times -3 = 27$

$\frac{3a}{a} = 3$, check $3 \times a = 3a$

$\frac{12n}{3} = 4n$, check $4n \times 3 = 12n$

1 Simplify and check.

a) $\frac{-24}{-6}$ = ..., check ..... $x\ -6 = -24$

b) $\frac{5y}{5}$ = ..., check ..... $x\ 5 = 5y$

c) $\frac{6a}{2}$ = ..., check ..... $x\ 2 = 6a$

d) $\frac{4n}{n}$ = ..., check ..... $x\ n = 4n$

2 Write your own check line.

a) $\frac{15}{-5}$ = ..., check .....

b) $\frac{3n}{n}$ = ..., check .....

c) $\frac{8a}{4}$ = ..., check .....

d) $\frac{5b}{-1}$ = ..., check .....

B And Check Again

More examples : $\frac{16a}{4a} = 4$, check $4 \times 4a = 16a$

$\frac{4ab}{2b} = 2a$, check $2a \times 2b = 4ab$

$\frac{24n^3}{8n} = 3n^2$, check $3n^2 \times 8n = 24n^3$

1 Simplify and check.

a) $\frac{30n}{5n}$ = ..., check .....

b) $\frac{15a}{3a}$ = ..., check .....

c) $\frac{24r}{3r}$ = ..., check .....

d) $\frac{18ab}{2b}$ = ..., check .....

e) $\frac{12mn}{4m}$ = ..., check .....

2 Simplify these expressions and check.

a) $\frac{r^5}{r^2}$ = ..., check .....

b) $\frac{18a^4}{6a^2}$ = ..., check .....

c) $\frac{8a^3}{4a}$ = ..., check .....

d) $\frac{30n^6}{6n^2}$ = ..., check .....

C Fractions

Fractions with variables are simplified the same way as fractions with numbers.

Compare the two columns.

numbers	variables
$\frac{4}{8} = \frac{\cancel{4} \times 1}{\cancel{4} \times 2} = \frac{1}{2}$	$\frac{4a}{8} = \frac{\cancel{4} \times a}{\cancel{4} \times 2} = \frac{a}{2}$
$\frac{15}{25} = \frac{3 \times \cancel{5}}{5 \times \cancel{5}} = \frac{3}{5}$	$\frac{3a}{a^2} = \frac{3 \times \cancel{a}}{a \times \cancel{a}} = \frac{3}{a}$
$\frac{150}{45} = \frac{2 \times \cancel{3} \times \cancel{5} \times 5}{3 \times \cancel{3} \times \cancel{5}} = \frac{10}{3}$	$\frac{6r^2}{9r} = \frac{2 \times \cancel{3} \times \cancel{r} \times r}{3 \times \cancel{3} \times \cancel{r}} = \frac{2r}{3}$

1 Simplify these expressions.

a) $\frac{2n}{6}$ .....

b) $\frac{10}{5a}$ .....

c) $\frac{4a}{ab}$ .....

d) $\frac{a^2}{3a}$ .....

e) $\frac{2a^3}{4a}$ .....

f) $\frac{4n}{6n^2}$ .....

g) $\frac{15a}{3ab}$ .....

h) $\frac{8rt^2}{12rt}$ .....

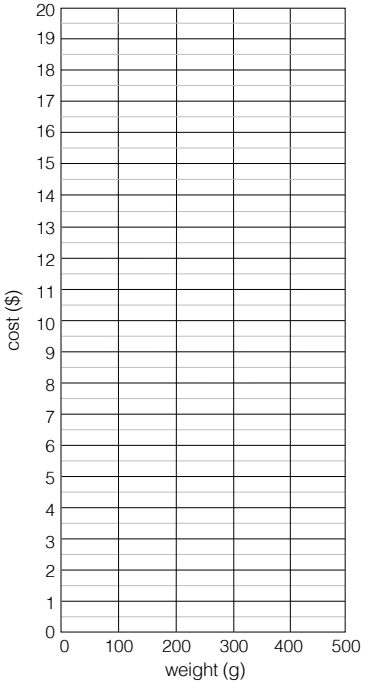
i) $\frac{6m^2n}{4mn^3}$ .....

j) $\frac{25a^4}{35a^6}$ .....

A Going Nuts

1 A supermarket has bins with peanuts and cashews nuts. Peanuts cost $1.50 per 100 g, cashew nuts cost $3.50 per 100 g.

a) Fill in the tables and draw two lines showing the cost of up to 500 g of nuts.



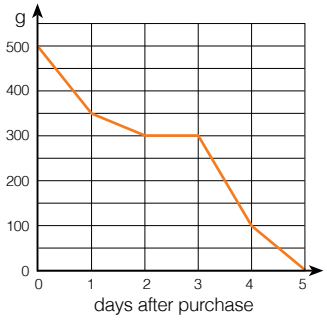
peanuts	
weight (g)	cost ($)
100	.....
200	.....
300	.....

cashew nuts	
weight (g)	cost ($)
100	.....
200	.....
300	.....

b) Use the graph to estimate the amount of cashews you can buy for $10. .....

c) Estimate how much **more** you pay for 450 g cashews compared to 450 g of peanuts. .....

2



Dylan bought 500 g of peanuts. He drew a graph showing the amount of peanuts left at the end of each day.

a) What amount was eaten on the first day. .....

b) What day were no peanuts eaten? .....

c) On what day were the most peanuts eaten? .....

How does the shape of the graph show this?

.....

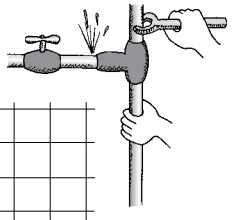
B The Plumber

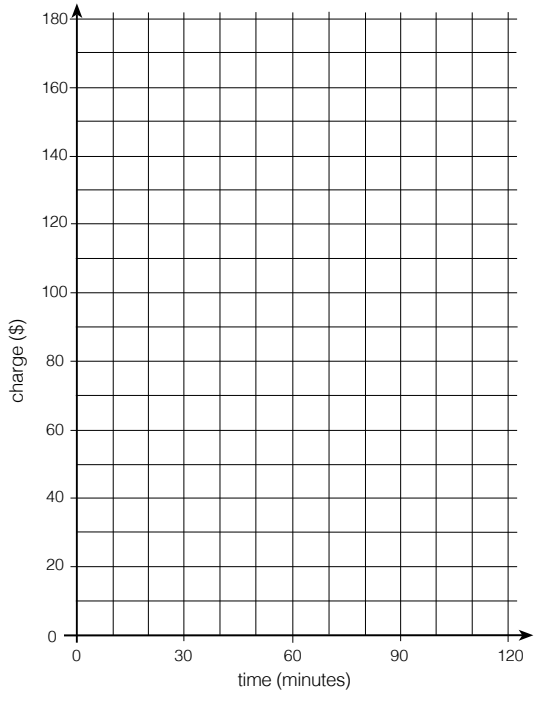
1 A plumber charges $40 call-out cost and then $35 per half hour (not including materials).

a) Fill in the table for jobs of different times.

time (min)	0	30	60	90	120
charge ($)		***75***			

b) Plot the graph, join points to form a straight line.





c) What is the charge for a job taking four and a half hours?

.....

2 Use your graph to estimate . . .

a) the charge for a job taking 1 hr 40 min.

.....

b) the time spent on a job costing $120.

.....

3 The plumber charged $105 for a job taking 50 minutes. How can you use the graph to show that this must be a mistake?

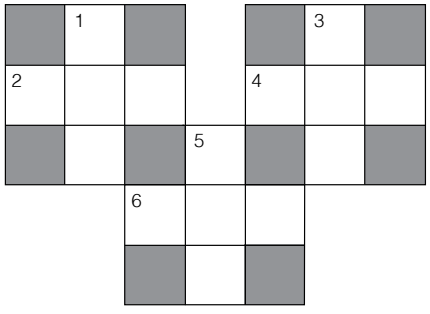
.....

.....

.....

A Divisions of Time

1 Fill in the cross number with the following clues.



Across

2. hours in a week
4. minutes in $3\frac{1}{2}$ hours
6. days in the first 6 months of 2025

Down

1. days in the year 2040
3. weeks in six years
5. seconds in $4\frac{2}{3}$ mins

Example : a) How many minutes in 2 h 35 mins?
b) How many hours and minutes in a total of 558 minutes?

Working : a) 2 x 60 + 35 = 155 minutes
b) 558 ÷ 60 = 9.3 hours
That means 9 whole hours and 0.3 of an hour.
0.3 of an hour = 0.3 x 60 = 18 minutes

Answer : 9h 18 mins

2 How many minutes in . . .

a) 4 h 28 min? ..... b) 10 h 6 min? .....

3a) How many minutes in 2 days, 4 hours and 22 minutes?

.....

b) How many seconds in 5 hours, 42 minutes, 8 seconds?

.....

4a) How many hours and minutes in 1043 minutes?

.....

.....

b) How many days and hours in 380 hours?

.....

.....

c) How many days, hours and minutes in 4015 minutes?

.....

.....

B Clocks

On the **24 hour clock** the hours are numbered from 0 to 23.
Four digits are used to express any time of day.

Examples :	0050	is	12.50 am
	0630	is	6.30 am
	1200	is	12.00 pm (noon)
	1910	is	7.10 pm
	2315	is	11.15 pm

1 Fill in the missing times in this table.

am / pm	8:15 am		12:55 am	
24 hour		1445		2020

2 Write in digital form (2 ways) . . .

a) Ten past five in the afternoon.

..... ; .....

b) Twenty to eleven at night.

..... ; .....

2

Hours Behind NZ Time (daylight saving not taken into account)	
Australia	
Sydney	2
Perth	4
India	6.5
South Africa	10
France	11
UK	12
USA	
California	20

This table shows how many hours some other countries are behind New Zealand in standard time.

If it is Thursday 8 am standard time in NZ, write down the day and time in..

a) India .....

b) California .....

c) UK .....

3 Zoe and Levi are on a student exchange. Levi went to Perth, Zoe went to France. It is July, which means it's summer in France, the clocks there have been put forward by 1 hour.

a) How many hours difference is there between Perth time and French summer-time?

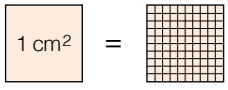
.....

.....

b) Levi phones Zoe at 4.15 pm Perth time. What time is it in France? .....

A Investigating Units

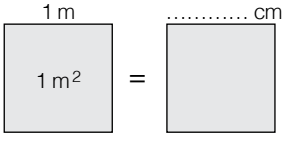
1



This diagram illustrates that $1\ cm^2 = 100\ mm^2$.

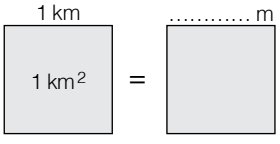
Complete these diagrams and the statements.

a)



$1\ m^2$ = ...cm^2

b)



$1\ km^2$ = ...m^2

For very large land areas the unit km^2 can be used. Another commonly used unit for large areas of land is the hectare. 1 ha = 10 000 m^2

2 Convert from one unit to another.

a) 3 cm^2 = ... mm^2

b) 8.4 m^2 = ... cm^2

c) 9.3 ha = ... m^2

d) 0.75 km^2 = ... m^2

e) 450 mm^2 = ... cm^2

f) 12 000 m^2 = ... ha

g) 900 000 m^2 = ... km^2

3 A lake has an area of 0.6 km^2. How many hectares is that?

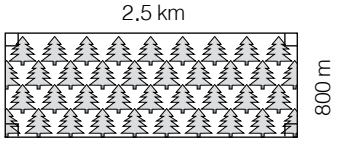
Complete : 0.6 km^2 = ... m^2

= ..... ha

4 A business card has an area of 44 cm^2. A piece of cardboard with an area of 0.6 m^2 will be cut into business cards. What is the largest possible number of business cards cut?

.....

5 Calculate the area of this forestry block. Answer in hectares.



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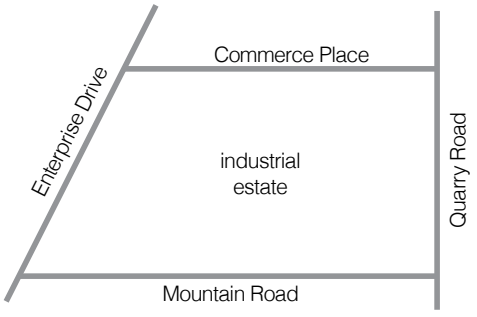
B Industrial Estate

1



scale : 1 cm represents 200 m

How large is the planned industrial area?
Give your answer in hectares.

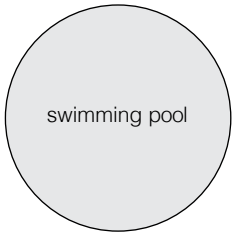
.....

.....

.....

.....

2



Calculate the area of this circular swimming pool.

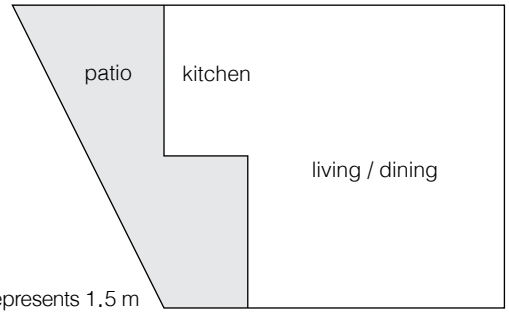
.....

.....

.....

scale : 1 cm represents 3 m .....

3



scale : 1 cm represents 1.5 m

a) Calculate the area of the open plan kitchen/living/dining space.

.....

.....

b) Calculate the area of the patio.

.....

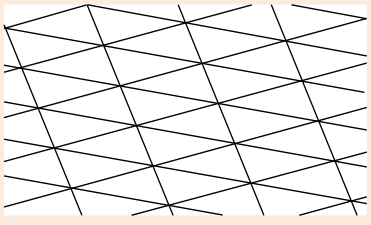
.....

A Triangles and Quadrilaterals

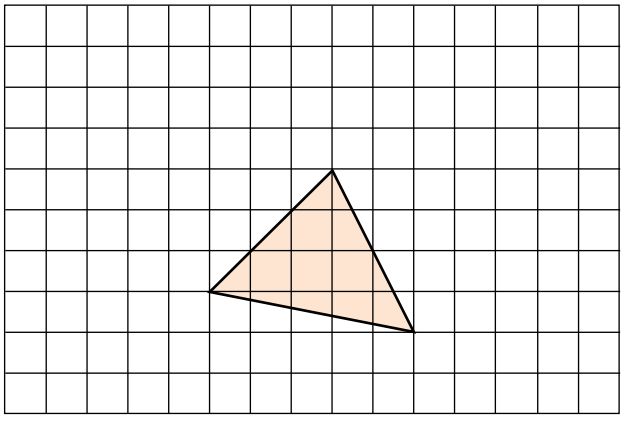
A shape **tessellates** if it can be used as a tile to completely cover an area without gaps.
The tile may be reflected, rotated or translated.

The diagram is called a **tessellation**.

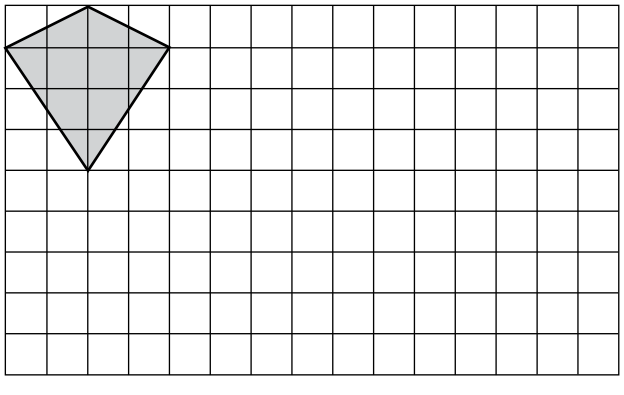
It shows that the triangle  tessellates



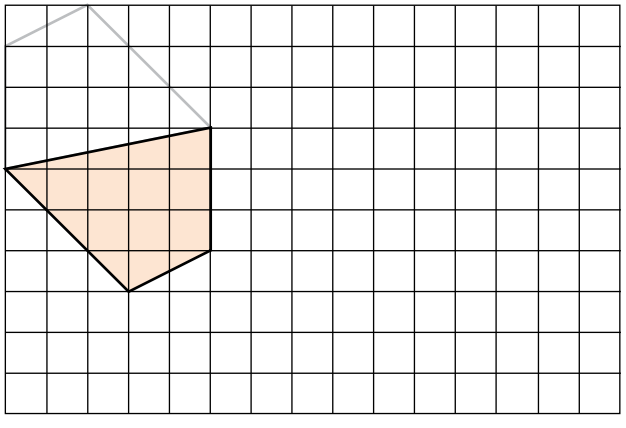
1 Show that this triangle tessellates.



2 Make a tessellation using the kite. Work in pencil.

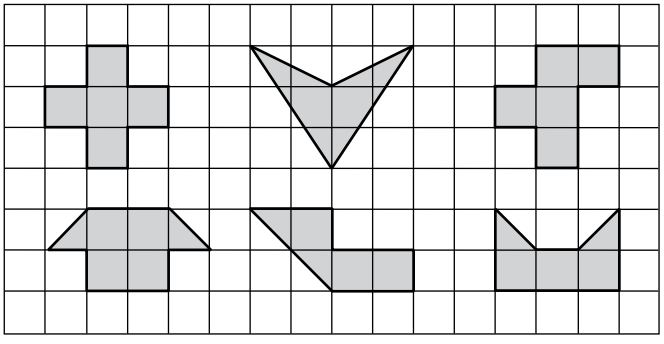


3 Make a tessellation using the quadrilateral.

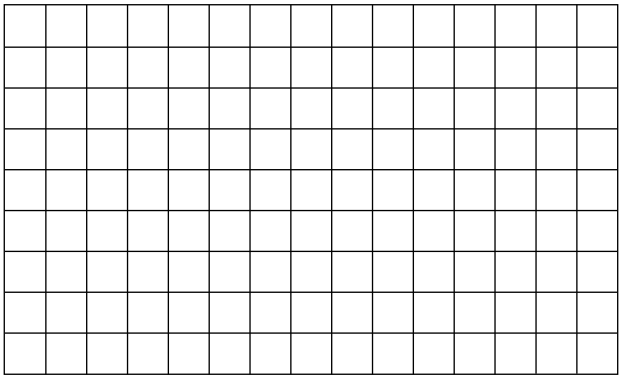


B Fancy Tessellations

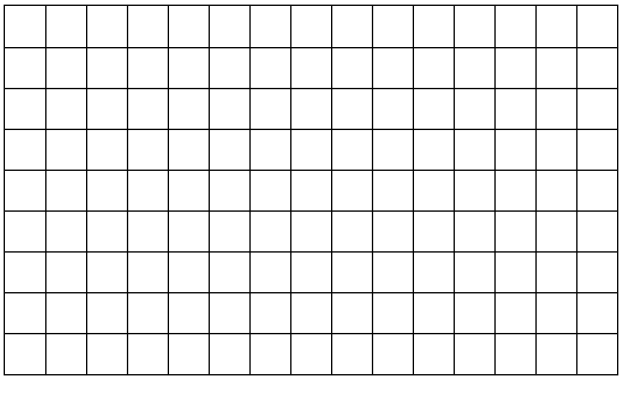
1 Here are six shapes, four of these tessellate, two don't tessellate. Choose carefully and show three tessellations on the grids below. [Hint : make a template]



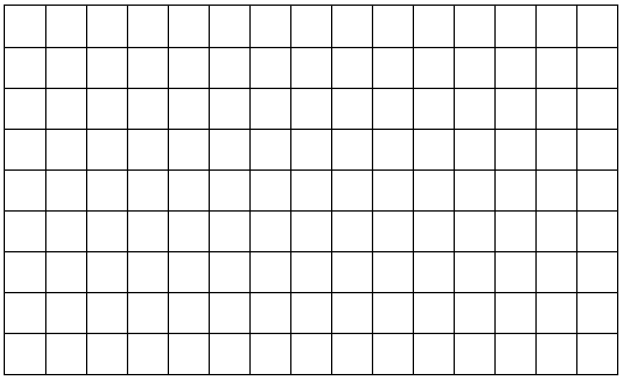
a)



b)



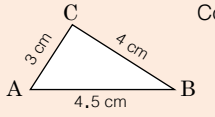
c)



A Construct and Measure

A **construction** is an exact drawing which is useful to find lengths of unknown sides or sizes of unknown angles.

Example : Here is a sketch of triangle ABC.
Construct ΔABC and measure ∠C.

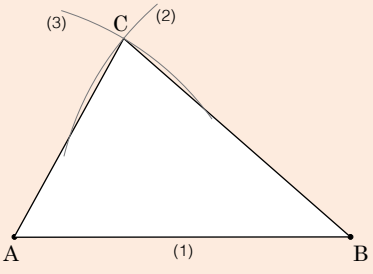


Working :

(1) Draw $\overline{AB}$ 4.5 cm.

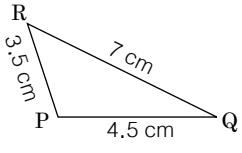
(2) With compasses set at 4 cm and the point in B, draw a long arc.

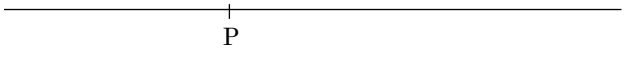
(3) With compasses set at 3 cm and the point in A, draw another arc which crosses the first.



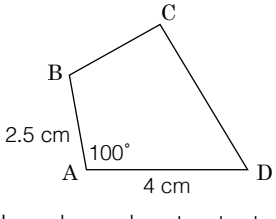
(4) The arc-crossing is corner C of the triangle. Join C with A and B. Now measure ∠C with your protractor. ∠C = 78°.

1 Here is a sketch of ΔPQR.
Construct ΔPQR and measure ∠P. ∠P = ... °





2



ABCD is a kite, which means . . .

$\overline{BC}$ = ...

$\overline{DC}$ = ...

Use ruler and protractor to construct the kite and measure diagonal $\overline{BD}$.

$\overline{BD}$ = ...

B Construct a 90° Angle

A 90° angle can be constructed without a protractor.

Example :

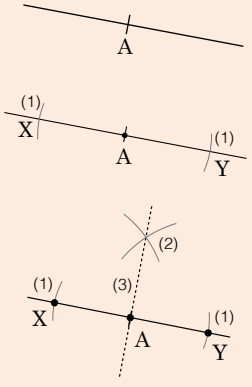
Construct a 90° angle in A, the line is one of its arms.

Working :

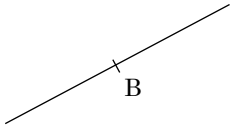
(1) Open the compasses a little and with the point in A draw two marks on the line (X and Y).

(2) Open the compasses wider and place the point in X and Y in turn drawing an arc-crossing.

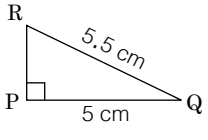
(3) Join A with the arc-crossing to make a 90° angle at A.



1 Construct a 90° angle in B.



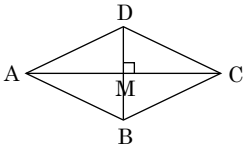
2



Construct this triangle with compasses and ruler only.
Measure the length of $\overline{PR}$.

$\overline{PR}$ = ...

3



How long are the sides of a rhombus with diagonals of 6 cm and 3 cm?.

A Measures of Centre

When summarising data we like to give an indication of the centre of the scores. **Mean**, **median** and **mode** are **measures of centre**.

mean is the *average score* = $\frac{\text{sum of all scores}}{\text{number of scores}}$.

median is the *middle score* after the scores have been ordered.

mode is the *most common score*, i.e. the score with the highest frequency.

Example :

loads on trucks (in tonnes)					
3.2	4.5	6.1	4.5	3.8	4.9
5.1	4.2	4.5	5.5	6.2	5.1

Calculate a) mean b) median c) mode

Working : a) mean = $\frac{3.2 + 4.5 + \ldots\ldots\ldots + 5.1}{12}$ = 4.8 t

b) ordered scores : 3.2, 3.8, 4.2, 4.5, 4.5, (4.5), (4.9), 5.1, 5.1, 5.5, 6.1, 6.2.

there are two middle scores → median = (4.5 + 4.9) ÷ 2 = 4.7 t

c) mode = 4.5 t

Running Time of Movies (minutes)						
100	122	95	110	100	126	106
135	160	104	118	100	120	134

1 Calculate a) mean, b) median, c) mode

.....

.....

.....

.....

.....

2 Maths Test Results

Girls					Boys				
				9	8				
	9	5	5	3	8	0	2	8	
9	8	7	7	2	7	3	4	4	7
		8	8	3	6	5	6	8	
				9	5				
				5	4				

This back-to-back stem and leaf plot shows the percentage scores in a maths test in 9Wil.

key : 9 | 8 = 98%

a) Work out mean and median for each group.

Boys : mean = ..., median = ...

Girls : mean = ..., median = ...

b) Is there a mode? Explain .....

.....

.....

.....

B In the City

1 Maximum temperatures were recorded in 25 New Zealand centres on 23rd April, 2018.

temp (°C)	f
18	5
19	0
20	6
21	7
22	5
23	2
Total	25

a) Write a list of the 25 temperatures :

18, 18, 18, 18, 18,

.....

.....

.....

.....

b) What is the mode? .....

c) Calculate the mean temperature. .....

d) Find the median. .....

2 This list shows the number of people in New Zealand's seventeen main urban areas as estimated in 2015.

a) Order the urban areas from largest population to the smallest.

Resident Population in the Main Urban Areas of NZ (2015)		
Whangarei	55 400	.....
Auckland	1 454 300	....1....
Hamilton	224 000	.....
Tauranga	130 800	.....
Rotorua	56 800	.....
Gisborne	35 700	.....
Napier/Hastings	129 700	.....
New Plymouth	56 300	.....
Whanganui	39 400	.....
Palmerston Nth	83 500	.....
Kapati	41 300	.....
Wellington	398 300	....2....
Nelson	64 800	.....
Blenheim	30 600	.....
Christchurch	381 800	.....
Dunedin	117 400	.....
Invercargill	50 300	.....

b) Calculate the median population size.

.....

c) Calculate the mean population size.

.....

d) Mean and median are usually very close. In this case there is a vast difference. Give a reason for this.

.....

.....

.....

A Probability from Tables

To work out the probability of an event, we can look at **patterns** that have happened in the past.

Example :

A shop sells iPad Airs in different colours. The table shows how many of each colour were sold last month. Calculate the probability that the next person who buys an iPad Air chooses gold.

colour of iPad Air	number sold
grey	27
gold	19
silver	42
total	88

Working : In the past 19 out of 88 people chose gold iPad Air ; $\frac{19}{88} = 22\%$

Answer : The probability that the next buyer chooses a gold iPad Air is 22%.

Notation : P(gold) = 22%

1 Mint lollies are sold in packets of 25, at least that is what is printed on the bags. Anna surveyed 20 bags of mint lollies and scored the results in a frequency table.

number of lollies	f
23	1
24	2
25	10
26	4
27	3
Total	20

Use the information to estimate the probability that the next bag of mint lollies Anne buys will have . . . .

a) exactly 25 mint lollies.

P(25) = ...

b) at least 25 mint lollies.

P(25 or more) = ...

2 After school Sharlene packs groceries in a large supermarket. On her shift between 4 pm and 6 pm, she recorded the amounts people paid for their groceries.

amount ($)	number of people
0.01 - 50.00	8
50.01 - 100.00	3
100.01 - 150.00	6
150.01 - 200.00	9
200.01 - 250.00	2
250.01 - 300.00	2
300.01 - 350.00	5

a) How many people did Sharlene survey?

.....

b) How many paid up to 50 dollars?

.....

c) Calculate the probability that on Sharlene's next shift a randomly selected customer pays at most $50.

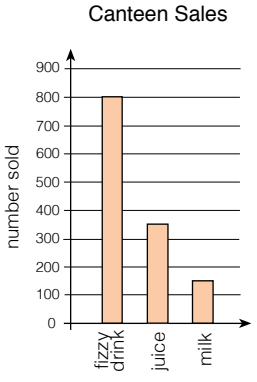
P(at most $50) = ...

d) Calculate P(at most $100) = ...

e) Calculate P(over $150) = ...

B Interpreting Graphs

1



This graph shows what type of drinks were sold last week at the canteen.

a) How many drinks were sold?

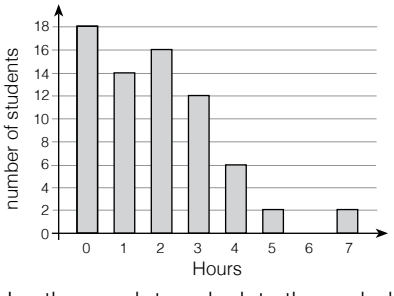
.....

Use the graph to calculate the probability that the next person buying a drink at the canteen . . .

b) buys a fizzy drink. P(fizzy) = ...

c) buys milk. P(milk) = ...

2



A group of 70 Year 9 students was asked to keep track of the hours of TV they watched over the weekend.
On Monday this bar graph was made from the results.

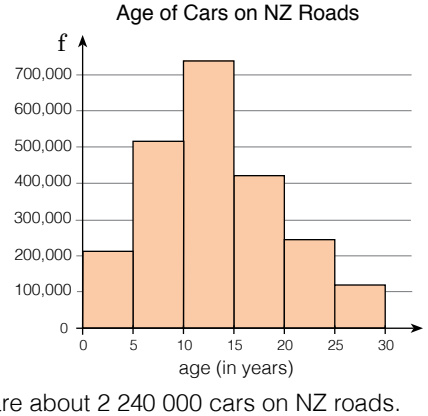
Use the graph to calculate the probability that a randomly chosen Year 9 student watches . . .

a) no TV in the weekend. P(no TV) = ...

b) more than 3 hours of TV in the weekend.

P(more than 3 hours TV) = ...

3



There are about 2 240 000 cars on NZ roads.
If one car is selected at random, calculate. . .

a) P(age under 5 years) = ...

b) P(age over 15 years) = ...