

# MATHEMATICS



Block 1

3rd Level

# Number Patterns and Sequences

## Exercise 1 (A)

Copy these sequences into your jotter and write down the next 2 numbers

- |                                    |                                    |                                    |
|------------------------------------|------------------------------------|------------------------------------|
| <b>1</b> 1, 2, 3, 4, ..., ...      | <b>2</b> 2, 4, 6, 8, ..., ...      | <b>3</b> 3, 5, 7, 9, ..., ...      |
| <b>4</b> 1, 4, 7, 10, ..., ...     | <b>5</b> 5, 8, 11, 14, ..., ...    | <b>6</b> 7, 11, 15, 19, ..., ...   |
| <b>7</b> 23, 22, 21, 20, ..., ...  | <b>8</b> 19, 17, 15, 13, ..., ...  | <b>9</b> 41, 43, 45, 47, ..., ...  |
| <b>10</b> 32, 34, 36, 38, ..., ... | <b>11</b> 16, 19, 22, 25, ..., ... | <b>12</b> 17, 20, 23, 26, ..., ... |
| <b>13</b> 39, 36, 33, 30, ..., ... | <b>14</b> 51, 48, 45, 42, ..., ... | <b>15</b> 21, 25, 29, 33, ..., ... |
| <b>16</b> 52, 56, 60, 64, ..., ... | <b>17</b> 4, 5, 6, 7, ..., ...     | <b>18</b> 9, 10, 11, 12, ..., ...  |
| <b>19</b> 4, 6, 8, 10, ..., ...    | <b>20</b> 6, 9, 12, 15, ..., ...   | <b>21</b> 10, 15, 20, 25, ..., ... |
| <b>22</b> 5, 7, 9, 11, ..., ...    | <b>23</b> 8, 11, 14, 17, ..., ...  | <b>24</b> 21, 19, 17, 15, ..., ... |
| <b>25</b> 36, 30, 24, 18, ..., ... | <b>26</b> 10, 13, 16, 19, ..., ... | <b>27</b> 23, 19, 15, 11, ..., ... |

## Exercise 1 (B)

Copy these sequences into your jotter and write down the next 2 numbers

- |  |  |
|--|--|
| <b>1</b> 19, 26, 33, 40, 47, ..., ...  | <b>2</b> 73, 62, 51, 40, 29, ..., ...                                      |
| <b>3</b> 19, 30, 41, 52, 63, ..., ...  | <b>4</b> 49, 41, 33, 25, 17, ..., ...                                      |
| <b>5</b> $\frac{1}{2}$ , 1, $1\frac{1}{2}$ , 2, $2\frac{1}{2}$ , ..., ...              | <b>6</b> 8, $7\frac{1}{2}$ , 7, $6\frac{1}{2}$ , 6, ..., ...               |
| <b>7</b> 0·2, 0·9, 1·6, 2·3, 3·0, ..., ...   | <b>8</b> 7·6, 6·5, 5·4, 4·3, 3·2, ..., ...                                 |
| <b>9</b> 13, 26, 39, 52, 65, ..., ...  | <b>10</b> 95, 80, 65, 50, 35, ..., ...                                     |
| <b>11</b> $\frac{1}{4}$ , $\frac{1}{2}$ , $\frac{3}{4}$ , 1, $1\frac{1}{4}$ , ..., ... | <b>12</b> $\frac{1}{2}$ , 2, $3\frac{1}{2}$ , 5, $6\frac{1}{2}$ , ..., ... |
| <b>13</b> 1, 3, 6, 10, 15, ..., ...  | <b>14</b> 1, 4, 9, 16, 25, ..., ...  |
| <b>15</b> 2, 4, 8, 14, 22, ..., ...  | <b>16</b> 1, 4, 10, 19, 31, ..., ...                                       |
| <b>17</b> 4, 7, 12, 19, 28, ..., ...   | <b>18</b> 0, 5, 15, 30, 50, ..., ...                                       |

- |           |                                    |           |   |
|-----------|------------------------------------|-----------|---|
| <b>19</b> | 0, 4, 12, 24, 40, ....., .....     | <b>20</b> | 22, 17, 13, 10, 8, ....., .....         |
| <b>21</b> | 41, 30, 21, 14, 9, ....., .....    | <b>22</b> | 18, 25, 31, 36, 40, ....., .....        |
| <b>23</b> | 1, 2, 4, 8, 16, ....., .....       | <b>24</b> | 1, 3, 9, 27, 81, ....., .....           |
| <b>25</b> | 3, 6, 12, 24, 48, ....., .....     | <b>26</b> | 320, 160, 80, 40, 20, ....., .....      |
| <b>27</b> | 224, 112, 56, 28, 14, ....., ..... | <b>28</b> | 15625, 3125, 625, 125, 25, ....., ..... |

## Exercise 1 (C)

Copy these sequences into your jotter and write down the next 2 numbers

- |           |   |           |                                     |
|-----------|---|-----------|-------------------------------------|
| <b>1</b>  | 1, 4, 11, 22, 37, ....., .....                                    | <b>2</b>  | 100, 87, 76, 67, 60, ....., .....   |
| <b>3</b>  | 1, 9, 24, 46, 75, ....., .....                                    | <b>4</b>  | 2, 3, 5, 8, 13, 21, ....., .....    |
| <b>5</b>  | 1, 5, 6, 11, 17, 28, ....., .....                                 | <b>6</b>  | 99, 61, 38, 23, 15, 8, ....., ..... |
| <b>7</b>  | 1, 4, 16, 64, ....., .....  | <b>8</b>  | 1, 10, 100, 1000, ....., .....      |
| <b>9</b>  | 32, 16, 8, 4, 2, ....., .....                                     | <b>10</b> | 162, 54, 18, 6, ....., .....        |
| <b>11</b> | 1, 2, 6, 24, 120, ....., .....                                    | <b>12</b> | 1, 4, 3, 6, 5, 8, ....., .....      |
| <b>13</b> | 2, 1, 6, 4, 10, 7, ....., .....                                   | <b>14</b> | 1, 5, 4, 10, 9, 15, ....., .....    |
| <b>15</b> | $1, 1\frac{1}{2}, 2\frac{1}{2}, 4, 6, 8\frac{1}{2}, \dots, \dots$ | <b>16</b> | 1, 1, 1, 3, 5, 9, 17, ....., .....  |
| <b>17</b> | 1, 2, 6, 15, 31, ....., .....                                     | <b>18</b> | 22, 16, 11, 7, 4, 2, ....., .....   |

You will need a calculator for the remaining questions. Find just the next number.

- |           |  |           |                                    |
|-----------|--|-----------|------------------------------------|
| <b>19</b> | 1, 8, 27, 64, 125, ....  | <b>20</b> | 1, 6, 36, 216, 1296, ....          |
| <b>21</b> | 1, 4, 27, 256, 3125, ....  | <b>22</b> | 1, 36, 71, 106, 141, ....          |
| <b>23</b> | $\frac{16}{25}, \frac{25}{36}, \frac{36}{49}, \frac{49}{64}, \frac{64}{81}, \frac{81}{100}, \dots$ |           |                                    |
| <b>24</b> | 10000, 1000, 100, 10, 1, ....  | <b>25</b> | 0.64, 0.49, 0.36, 0.25, 0.16, .... |

## Exercise 2 (A)

For each question:

- Copy and complete the table
- Write down the **rule** for the table

1

<b>A</b>	1	2	3	4	5	6		12
<b>B</b>	3	5	7					

2

<b>C</b>	1	2	3	4	5	6		10
<b>D</b>	2	5	8					

3

<b>E</b>	1	2	3	4	5	6		11
<b>F</b>	4	7	10					

4

<b>G</b>	1	2	3	4	5	6		20
<b>H</b>	3	7	11					

5

<b>I</b>	1	2	3	4	5	6		12
<b>J</b>	5	7	9					

6

<b>K</b>	1	2	3	4	5	6		10
<b>L</b>	2	6	10					

7

<b>M</b>	1	2	3	4	5	6		9
<b>N</b>	1	4	7					

8

<b>P</b>	1	2	3	4	5	6		12
<b>Q</b>	7	11	15					

9

<b>R</b>	1	2	3	4	5	6		20
<b>S</b>	4	9	14					

10

<b>T</b>	1	2	3	4	5	6		11
<b>V</b>	0	3	6					

11

<b>W</b>	1	2	3	4	5	6		13
<b>X</b>	8	11	14					

12

<b>Y</b>	1	2	3	4	5	6		10
<b>Z</b>	8	13	18					

13

<b>A</b>	1	2	3	4	5	6		15
<b>B</b>	10	12	14					

14

<b>C</b>	1	2	3	4	5	6		10
<b>D</b>	10	13	16					

15

<b>E</b>	1	2	3	4	5	6		10
<b>F</b>	9	13	17					

16

<b>G</b>	1	2	3	4	5	6		10
<b>H</b>	5	11	17					

## Exercise 2 (B)

For each question:

- Copy and complete the table
- Write down the **formula** which works for the table

1

<b>A</b>	1	2	3	4	5	6		30
<b>B</b>	5	8	11					

2

<b>C</b>	1	2	3	4	5	6		25
<b>D</b>	6	8	10					

3

<b>E</b>	1	2	3	4	5	6		50
<b>F</b>	1	3	5					

4

<b>G</b>	1	2	3	4	5	6		100
<b>H</b>	1	4	7					

5

<b>J</b>	1	2	3	4	5	6		60
<b>K</b>	4	7	10					

6

<b>L</b>	1	2	3	4	5	6		25
<b>M</b>	5	9	13					

7

<b>N</b>	1	2	3	4	5	6		30
<b>P</b>	4	9	14					

8

<b>Q</b>	1	2	3	4	5	6		40
<b>R</b>	1	5	9					

9

<b>S</b>	1	2	3	4	5	6		35
<b>T</b>	7	9	11					

10

<b>U</b>	1	2	3	4	5	6		40
<b>V</b>	7	12	17					

11

<b>W</b>	1	2	3	4	5	6		15
<b>X</b>	7	11	15					

12

<b>Y</b>	1	2	3	4	5	6		50
<b>Z</b>	6	12	18					

13

<b>N</b>	1	2	3	4	5	6		30
<b>C</b>	11	17	23					

14

<b>B</b>	1	2	3	4	5	6		75
<b>W</b>	11	21	31					

15

<b>C</b>	1	2	3	4	5	6		70
<b>S</b>	3	7	11					

16

<b>N</b>	1	2	3	4	5	6		30
<b>T</b>	10	17	24					

## Exercise 2 (C)

For each question:

- Copy and complete the table
- Write down the **formula** which works for the table

1

D	1	2	3	4	5		36	
A	1	3	5					81

2

T	1	2	3	4	5		27	
K	7	10	13					100

3

P	1	2	3	4	5		18	
F	1	5	9					97

4

Z	1	2	3	4	5		37	
S	8	11	14					158

5

C	1	2	3	4	5		200	
L	10	12	14					200

6

G	1	2	3	4	5		43	
X	9	13	17					77

7

R	1	2	3	4	5		18	
M	1	6	11					121

8

U	1	2	3	4	5		22	
B	7	13	19					211

9

Q	1	2	3	4	5		41	
V	8	13	18					303

10

E	1	2	3	4	5		300	
Y	4	12	20					300

11

N	1	2	3	4	5		24	
M	1½	2	2½					16

12

P	1	2	3	4	5		30	
Q	0	½	1					30

13

A	2	4	6	8	10		49	
B	7	11	15					49

14

C	2	4	6	8	10		17	
D	5	11	17					101

15

E	3	6	9	12	15		36	
F	13	25	37					225

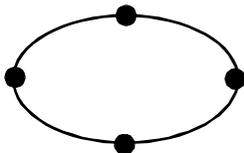
16

G	1	2	3	4	5		11	
H	2	5	10	17				401

### Exercise 3 (A)

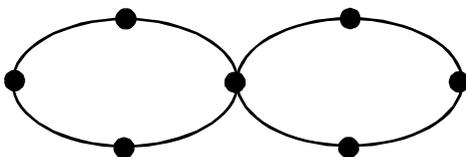
- 1 A manufacturer makes necklaces in various sizes.

The smallest size has a single link which is made up of **1 ring and 4 beads**.



1 ring 4 beads

The next size looks like this:



2 rings 7 beads

- a Draw the next size in the sequence.  
b Complete this table to show how the pattern is built up.

Number of rings	1	2	3	4	5		13
Number of beads	4	7					

- c Write down a rule for finding the number of beads if you know the number of rings.

2 The following patterns are made using circles.



Pattern 1



Pattern 2



Pattern 3

a Draw Pattern 4

b Complete this table showing how many circles are needed for each pattern.

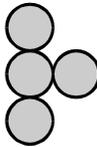
Pattern Number	1	2	3	4	5	6		12
Number of Circles								

c Write down a rule for finding the number of circles if you know the pattern number.

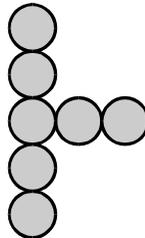
3 These patterns are made with circles.



Pattern 1



Pattern 2



Pattern 3

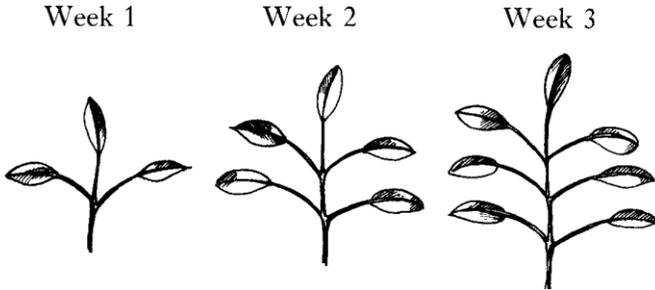
a In the space above, draw pattern 4.

b Complete the table.

Pattern number	1	2	3	4	5	6		12
Number of circles	1	4						

c Write down a rule for finding the number of circles if you know the pattern number.

- 4 The growth of a plant over three weeks is shown in these sketches.



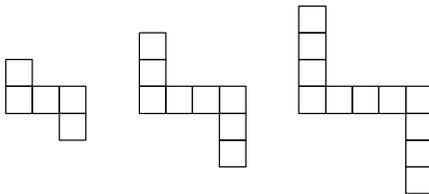
The plant continues to grow at the same rate.

- a Draw a sketch to show what the plant will look like in week 4.  
 b Complete the table to show the continued growth of the plant.

Week	1	2	3	4	5	6		12
Number of leaves	3	5						

- c Write down a rule for finding the number of leaves on the plant if you know the number of weeks it has been growing.

- 5 These patterns are made with squares.



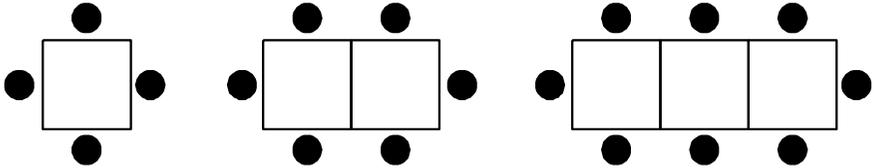
Pattern 1    Pattern 2    Pattern 3    Pattern 4

- a Draw Pattern 4 in the space above.  
 b Complete this table.

Pattern number	1	2	3	4	5	6		11
Number of squares								

- c Write down a rule for finding the number of squares if you know the pattern number.

6 The diagrams below show the number of people sitting at desks.



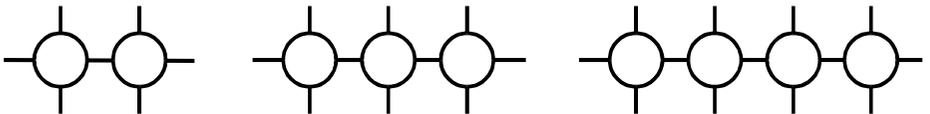
- a Draw the next diagram in the sequence
- b Complete the table below for this pattern.

Number of desks	1	2	3	4		10		20
Number of people								

- c Write down a rule for finding the number of people if you know the number of desks.

7 John was doodling during his art lesson and stumbled upon an interesting pattern. He noticed that if he joined two circles by a straight line and then added other lines around the sides an ordered pattern was formed.

The first three doodles in his pattern are shown below.

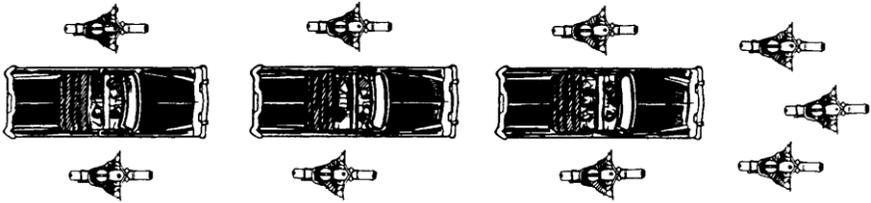


- a Draw the next doodle in John's pattern.
- b Complete the table below to show how many lines there would be around a particular number of circles.

Number of circles	2	3	4	5	6	7	8		20
Number of lines	7	10	13						

- c Write down a rule describing how you would find the number of lines if you were given the number of circles.

- 8 When a line of cars is given a police escort, it is led by three motorbikes and each car has a motorbike on either side.

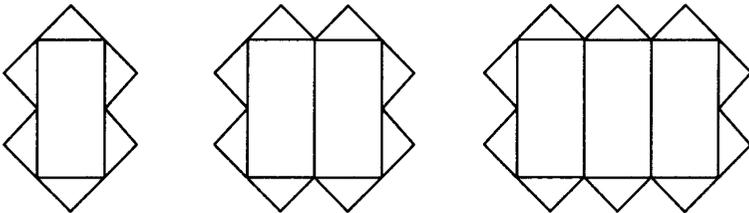


- a Complete the table.

Number of cars	2	3	4	5	6		13
Number of motorbikes		9					

- b Write down a rule for finding the number of motorbikes if you know the number of cars.

- 9 A design consists of rectangles and triangles. The first three patterns are shown.



- a Complete this table

Number of rectangles	1	2	3	4	5	6		9
Number of triangles	6	8						

- b Write down a rule for finding the number of triangles if you know the number of rectangles.

10



Candle holders are made up from a top, link sections and a base.



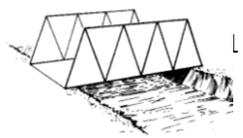
↕ 1cm top

a Complete this table

Number of link sections	1	2	3	4	5	6		11
Height of candle holder (cm)	6	10						

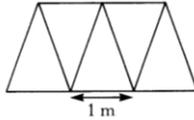
b Write down a rule for finding the height of a candle holder if you know the number of link sections.

### Exercise 3 (B)



- 1 The sides of bridges can be made by joining together identical triangular plates, each with a base length of 1 metre.

The diagram below shows one side of a bridge 3 metres long, which needs 5 plates.



- a Copy and complete the table below.

Length of bridge in metres (L)	3	4	5	6	7		20
Number of plates for one side (N)	5						

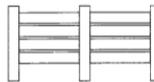
- b Write down a formula for the number of plates,  $N$ , needed to make one side of a bridge of length  $L$  metres.
- c Can one side of a bridge have exactly 90 plates? Explain your answer.

- 2 A children's play area is to be fenced.

The fence is made in sections using lengths of wood as shown.



1 section



2 sections



3 sections

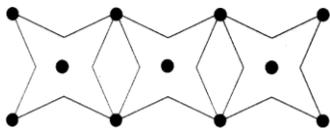
- a Copy and complete the table.

Number of sections ( $s$ )	1	2	3	4	5		12
Number of lengths of wood ( $w$ )	6	11					

- b Write down a formula for calculating the number of lengths of wood ( $w$ ), when you know the number of sections ( $s$ ).

- 3 Jenni is making a wallpaper border.

She is using stars and dots to make the border.



a Copy and complete the table.

Number of stars (s)	1	2	3	4	5
Number of dots (d)			11		

b Write down a formula for calculating the number of dots (d), when you know the number of stars (s).

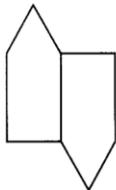
4 Sandra is working on the design for a bracket.

She is using matches to make each shape.

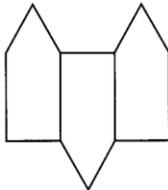
Shape 1



Shape 2



Shape 3

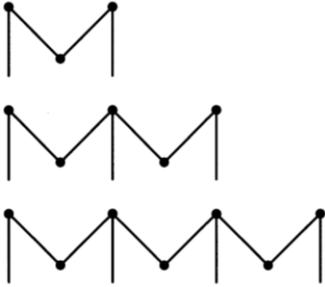


a Copy and complete the table.

Shape number (s)	1	2	3	4	5	6		13
Number of matches (m)	5	9			21			

b Find a formula for calculating the number of matches, (m), when you know the shape number, (s).

5 Mhairi makes necklaces in M-shapes using silver bars.



a Copy and complete the table.

Number of M-shapes ( $m$ )	1	2	3	4		15
Number of matches ( $b$ )	4	7				

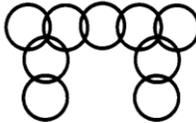
b Write down a formula for calculating the number of bars ( $b$ ) when you know the number of M-shapes ( $m$ ).

6 Samira is designing a chain belt.

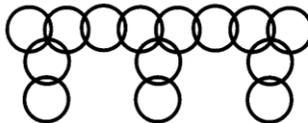


1 section, 4 rings

Each section of the belt is made from metal rings as shown.



2 sections, 9 rings



3 sections

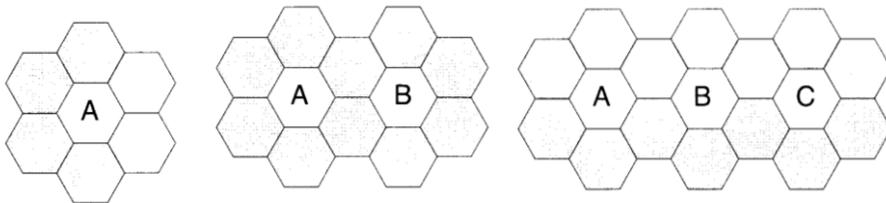
a Copy and complete the table below.

Number of sections ( $s$ )	1	2	3	4	5		11
Number of metal rings ( $r$ )	4	9					

b Write down a formula for calculating the number of rings ( $r$ ) when you know the number of sections ( $s$ ).

7 Carla is laying a path in a nursery school.

She is using a mixture of alphabet tiles and blank tiles.

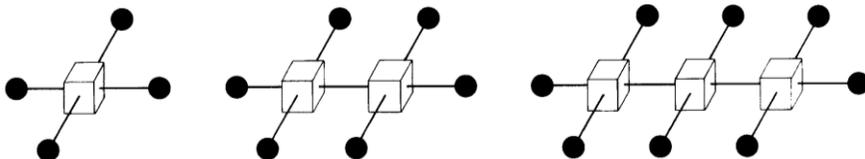


a Copy and complete the table below

Number of alphabet tiles (a)	1	2	3	4	5		12
Number of blank tiles (b)	6	10					

b Write down a formula for calculating the number of blank tiles (b) when you know the number of alphabet tiles (a).

8 A child is playing with a set of cubes and spheres and his mother notices that the shapes he is making form a pattern. The first three shapes are shown below.

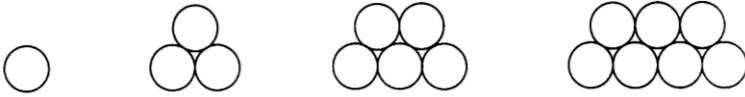


a Copy and complete the table below.

Number of cubes (c)	1	2	3	4	5	6		20
Number of spheres (s)	4	6						

b Write down a formula for calculating the number of spheres (s) when you know the number of cubes (c).

- 9 A pipe factory makes circular pipes. The storeman arranges the pipes in stacks which form a pattern. The stacks must not be higher than two layers. The first four stacks are shown below.



- a Copy and complete the table below.

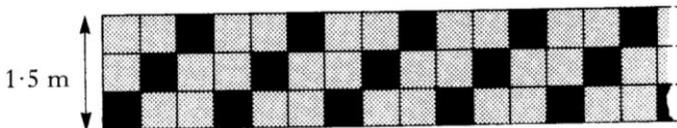
Stack (s)	1	2	3	4	5	6		15
Number of pipes (p)	1	3	5					

- b Write down a formula for calculating the number of pipes (p) when you know the stack (s).
- c The storeman has to store 12 pipes. He finds that he has to use more than one stack from the pattern to do this.
- (i) Why is it not possible to use only one stack from the pattern?
- (ii) Draw a possible set of stacks for the 12 pipes.

- 10 In a large office block, the corridor floors are covered with carpet tiles. The corridors are 1.5 metres wide.

The carpet tiles are half-metre squares and they come in two colours, grey and black.

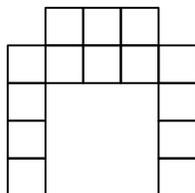
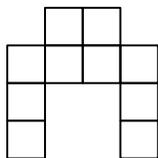
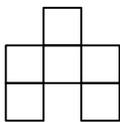
The pattern in one of the corridors is shown below.



- a How many grey tiles are there in every metre length of corridor?
- b If there are G grey tiles in L metres of corridor, write down a formula for G.
- c Could this corridor have exactly 39 grey tiles?  
Explain clearly your answer.

### Exercise 3 (C)

- 1 Here is a sequence of patterns.



1st pattern

2nd pattern

3rd pattern

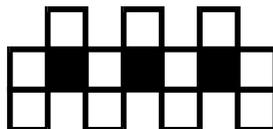
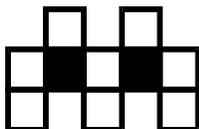
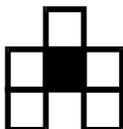
4th pattern

- a Copy and complete the table below.

Pattern number ( $n$ )	1	2	3	4	5		12
Number of squares ( $s$ )							

- b Write down the formula for the number of squares in the  $n^{\text{th}}$  diagram.  
 c Which pattern has 130 squares?

- 2 The diagrams below are the first three in a sequence.



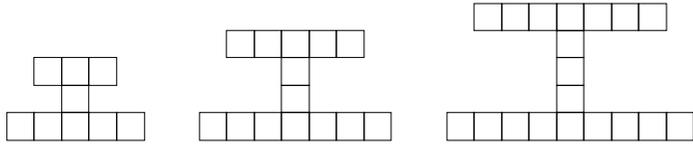
Each diagram is made up of black and white squares.

- a Following the pattern copy and complete the table.

Number of black squares ( $B$ )	1	2	3	4	5	6		12
Number of white squares ( $W$ )		8						

- b Write down the formula for the number of white squares,  $W$ , if there are  $B$  black squares.  
 c How many black squares are there if there are 65 white squares?

- 3 The diagram below shows the 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> diagrams in a sequence.



1st

2nd

3rd

4th

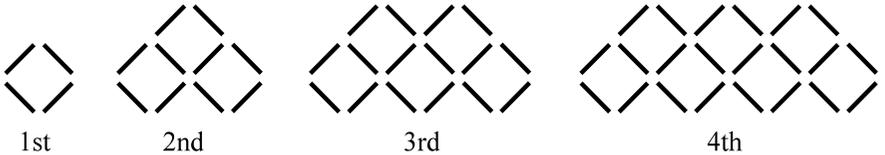
- a Copy and complete the table below.

Diagram Number (n)	1	2	3	4	5	6		80
Number of squares (s)								

- b Draw the first diagram in the sequence.  
 c Write down a formula for **s** in terms of **n**.  
 d Which diagram has 94 squares?

- 4 A child is making a sequence of zigzag patterns using rods.

These are the first few diagrams in the sequence.



1st

2nd

3rd

4th

- a Copy and complete the table below.

Diagram Number (n)	1	2	3	4	5	6		12
Number of rods (r)	4	10						

- b How many rods are in the  $n^{\text{th}}$  diagram. Write your answer as a formula.  
 c Which diagram in the sequence has **400 rods**?

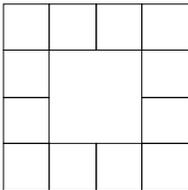
- 5 Easyloan Hire Company hires out tools and building equipment.

The cost (£C) of hiring a ladder for , d, days is shown in the table below.

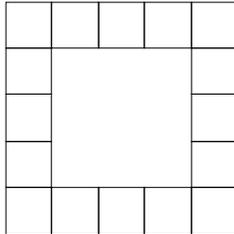
Number of days (d)	2	3	4	5
Cost in £s (C)	11	15	19	23

- Write down a formula connecting C and d.
- Use your formula to calculate the cost of hiring a ladder for a fortnight.
- How many days is the ladder hired for if the cost is £111?

- 6 The first 2 patterns in a sequence of diagrams are shown below.



1st



2nd

3rd

The first diagram contains 12 **small** squares.

- How many **small** squares are in the 3<sup>rd</sup> diagram?
- Copy and complete the table below.

Diagram number (n)	1	2	3	4	5		10
Number of small squares (s)	12						

- Write down the formula for s in terms of n.
- Which diagram has 200 squares?

- 7 A child is making patterns of the letter **H** using square tiles.

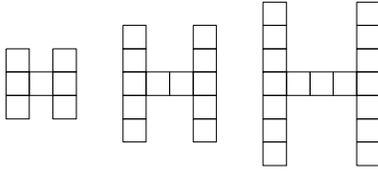


Diagram 1    Diagram 2    Diagram 3

- a Copy and complete the table below.

Diagram number ( $n$ )	1	2	3	4	5		10
Number of tiles ( $t$ )	7						

- b Write down the formula for  $t$  in terms of  $n$ .

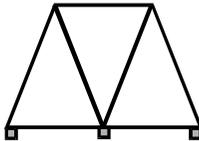
- c Which diagram has 222 tiles?

- 8 The sides of a bridge are constructed by joining sections.

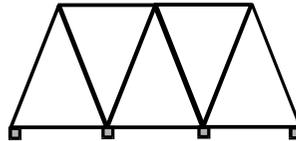
The sections are made of steel girders.



1 section  
3 girders



2 sections  
7 girders



3 sections

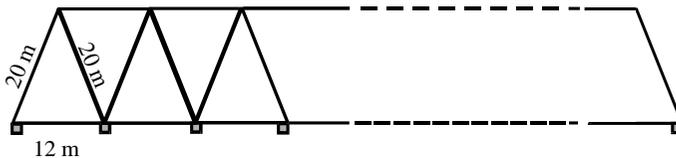
- a Copy and complete the table below

Number of sections ( $s$ )	1	2	3	4		10
Number of girders ( $g$ )	3	7				

- b Write down a formula for the number of girders,  $g$ , when you know the number of sections,  $s$ .

- c Each section is an isosceles triangle.

The base is 12 metres long and the other girders are 20 metres long.



Find the total length of girders for one side of a bridge 96 metres long.

9 The number squares below have L-outlines drawn on them.

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	32	33	34	35
36	37	38	39	40	41	42
43	44	45	46	47	48	49

The number at the top of this **L-outline** is 1.

The total of the three numbers in the **L-outline** is 18,  
(ie  $1 + 8 + 9$ )

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	32	33	34	35
36	37	38	39	40	41	42
43	44	45	46	47	48	49

The number at the top of this **L-outline** is 17.

The total of the three numbers in the **L-outline** is 66

a Draw the L-outline when the number at the top is 27.

Find the total of the three numbers in this L-outline.

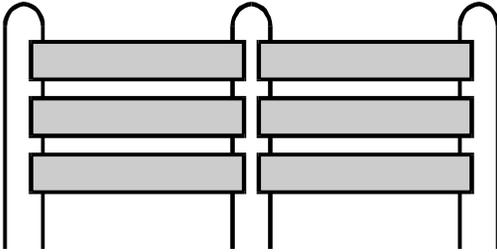
b Complete the table below.

Number at top of L-outline (N)	1	2	3	4	5	6
Total of numbers in L-outline (T)	18					

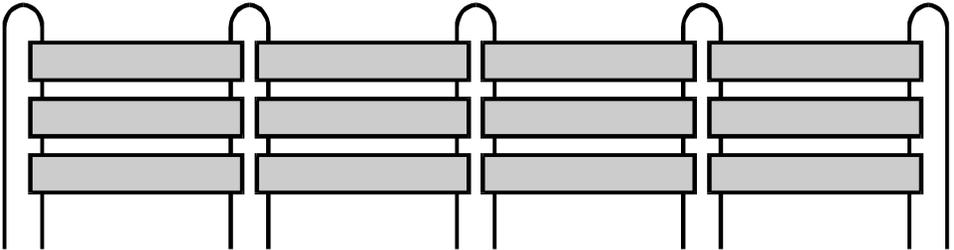
c Write down a formula for the total, T, of the numbers in an L-outline when the number at the top of the L-outline is N.

d If the total in an L-outline is 129 find the three numbers.

10 A garden fence arrangement can be built in patterns as shown.



This fence pattern is made up with **3 fenceposts** and **6 panels**.



This fence pattern is made up with **5 fenceposts** and **12 panels**.

a Copy and complete the table below.

Number of fenceposts (F)	2	3	4	5	6	7
Number of panels (P)		6				

b Write down a formula connecting **P** and **F**.

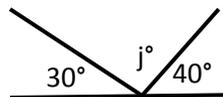
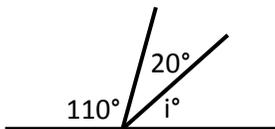
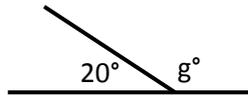
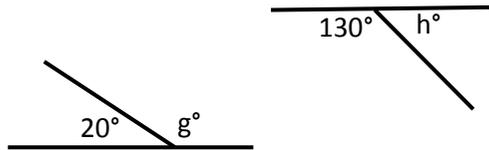
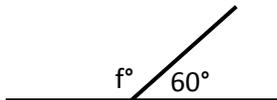
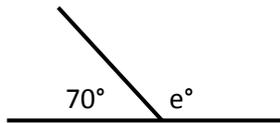
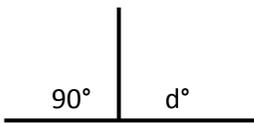
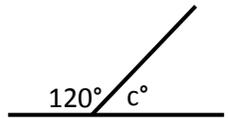
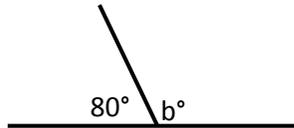
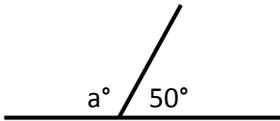
c A farmer buys **144 panels** and **52 fenceposts** to build a fence like those above.

How many fenceposts are left over if all of the panels are used up?

# Angle Properties

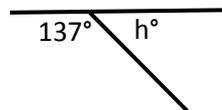
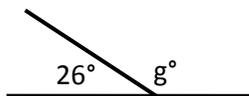
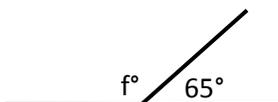
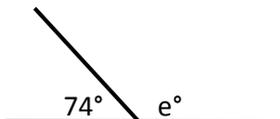
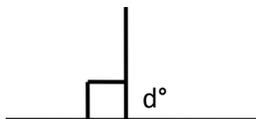
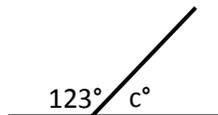
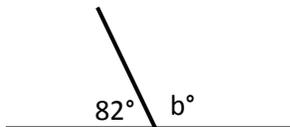
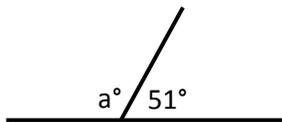
## Exercise 1 (A)

Work out the sizes of the angles marked with a letter in each of the following diagrams:-



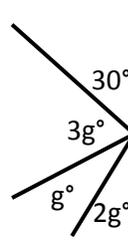
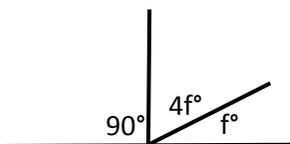
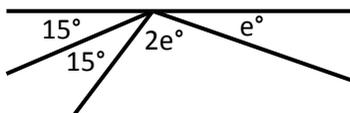
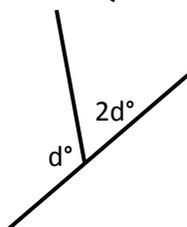
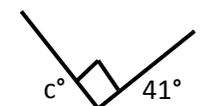
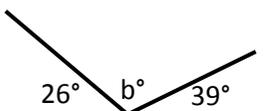
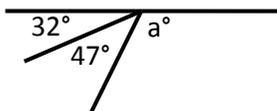
## Exercise 1 (B)

Work out the sizes of the angles marked with a letter in each of the following diagrams:-



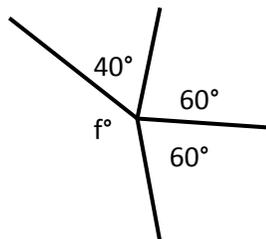
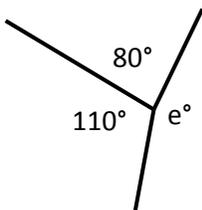
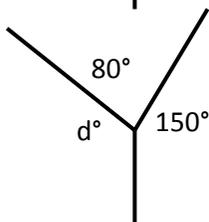
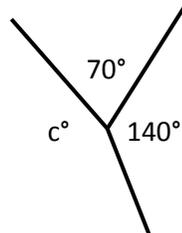
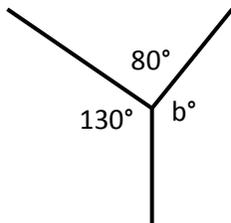
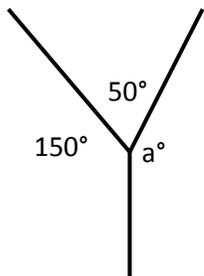
## Exercise 1 (C)

Work out the sizes of the angles marked with a letter in each of the following diagrams



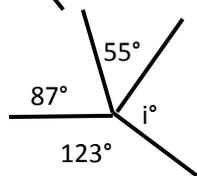
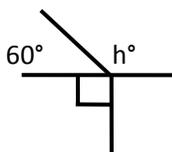
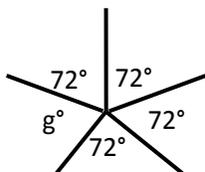
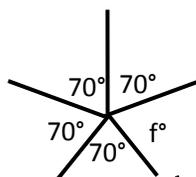
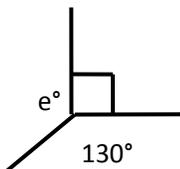
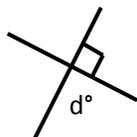
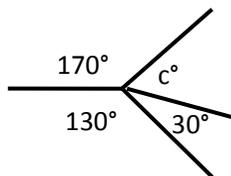
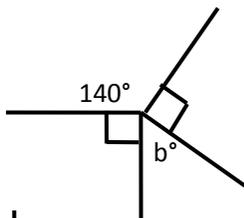
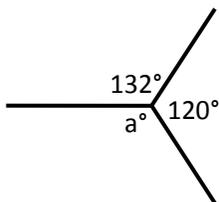
## Exercise 2 (A)

Work out the sizes of the angles marked with a letter.



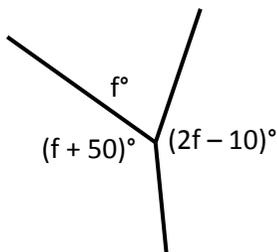
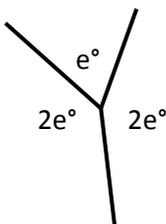
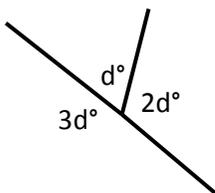
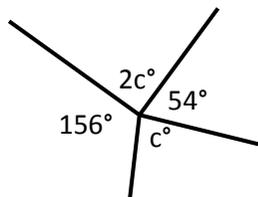
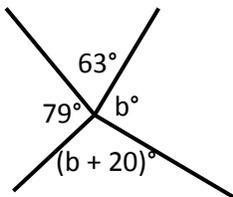
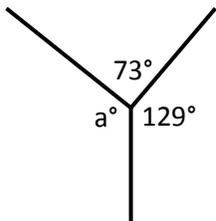
## Exercise 2 (B)

Work out the sizes of the angles marked with a letter.



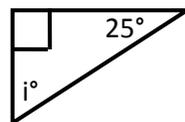
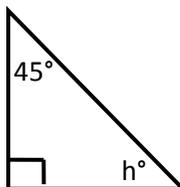
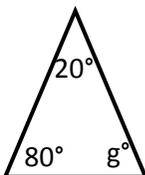
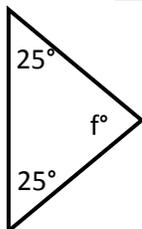
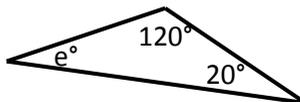
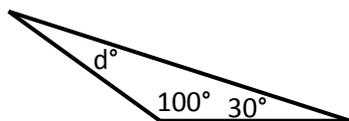
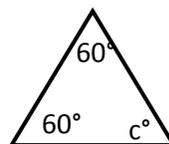
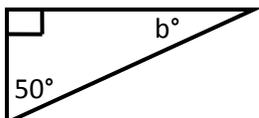
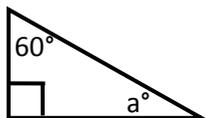
## Exercise 2 (C)

Work out the sizes of the angles marked with a letter.



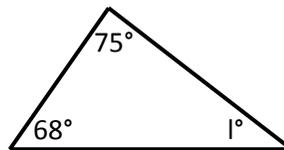
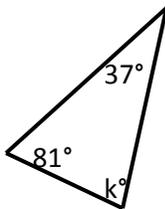
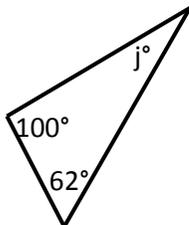
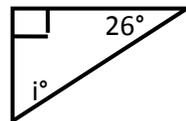
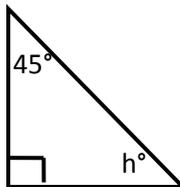
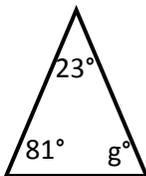
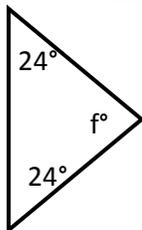
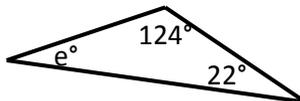
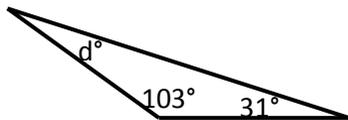
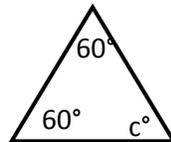
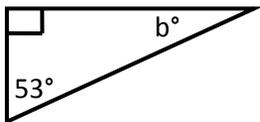
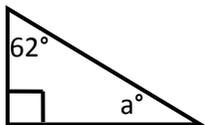
## Exercise 3 (A)

Work out the sizes of the angles marked with a letter in each of the following triangles:-



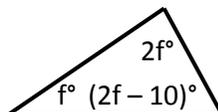
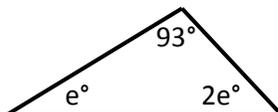
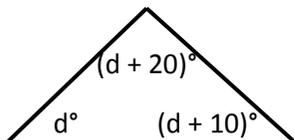
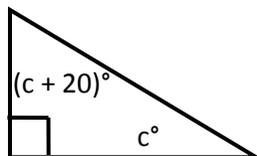
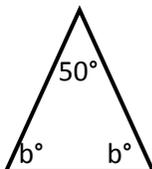
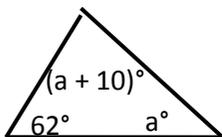
### Exercise 3(B)

Work out the sizes of the angles marked with a letter in each of the following triangles:-



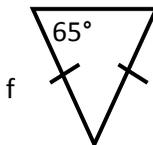
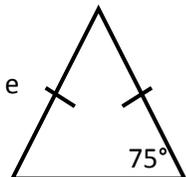
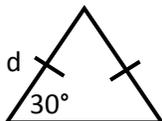
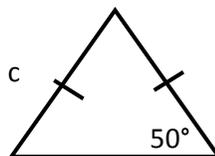
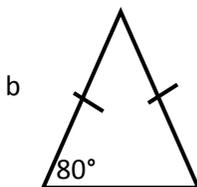
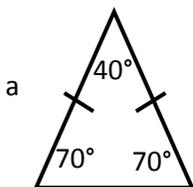
### Exercise 3 (C)

Work out the sizes of the angles marked with a letter in each of the following triangles:-



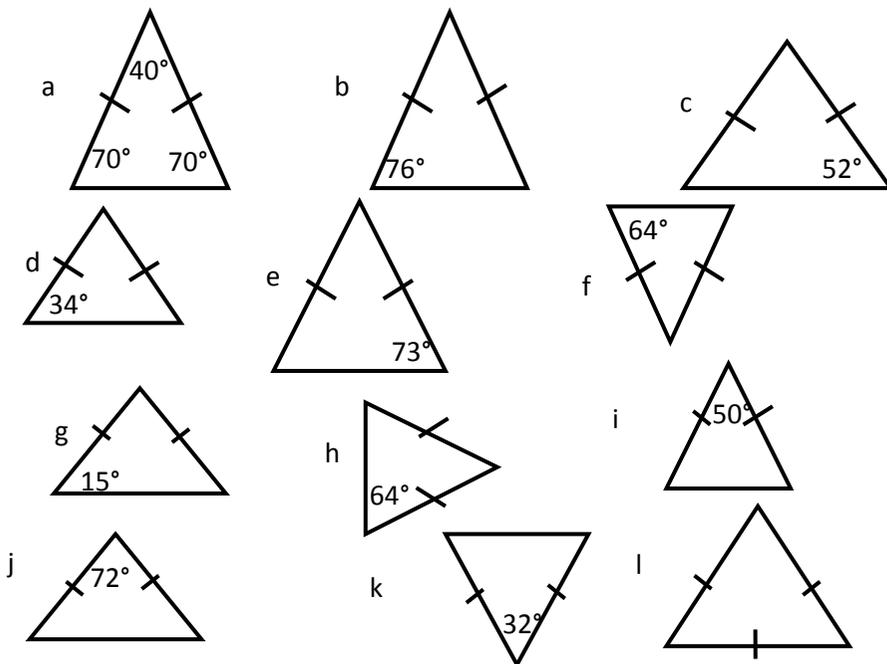
### Exercise 4 (A)

Copy the following ISOSCELES triangles into your jotter and fill in the sizes of all the angles. The first one has been done for you:-



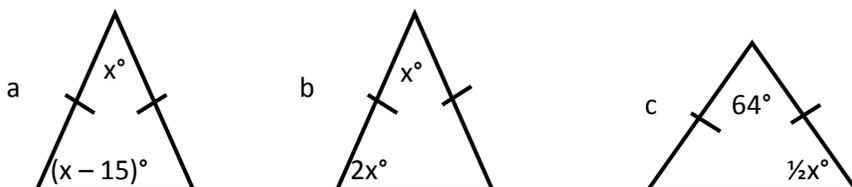
### Exercise 4 (B)

Copy the following ISOSCELES triangles into your jotter and fill in the sizes of all the angles. The first one has been done for you:-



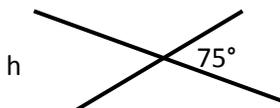
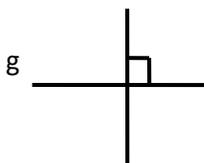
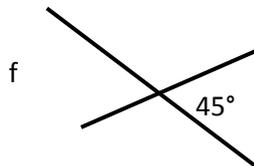
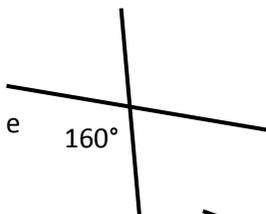
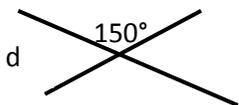
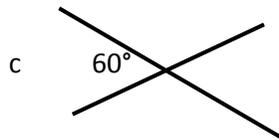
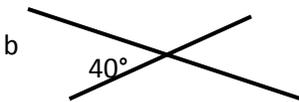
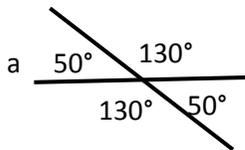
### Exercise 4 (C)

Copy the following diagrams into your jotter and fill in the sizes of all the angles.



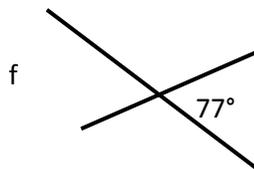
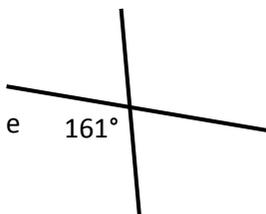
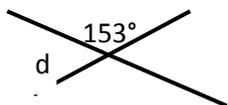
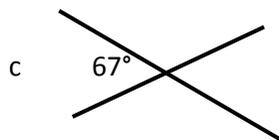
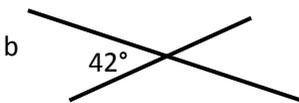
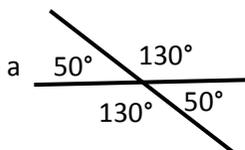
### Exercise 5 (A)

Copy the following diagrams into your jotter and fill in the sizes of all the angles. The first one has been done for you.



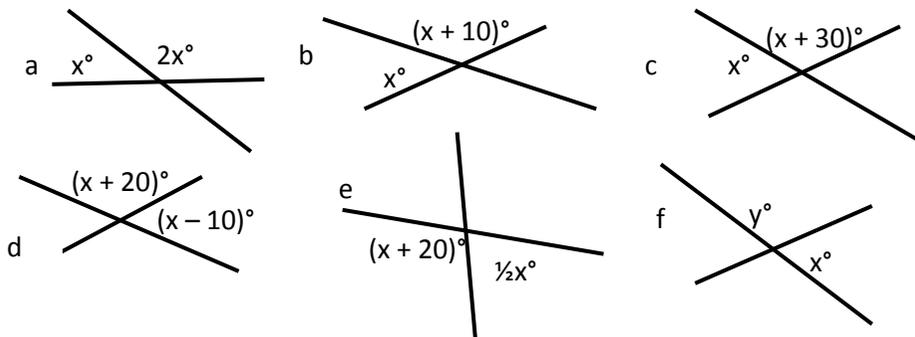
### Exercise 5 (B)

Copy the following diagrams into your jotter and fill in the sizes of all the angles. The first one has been done for you.



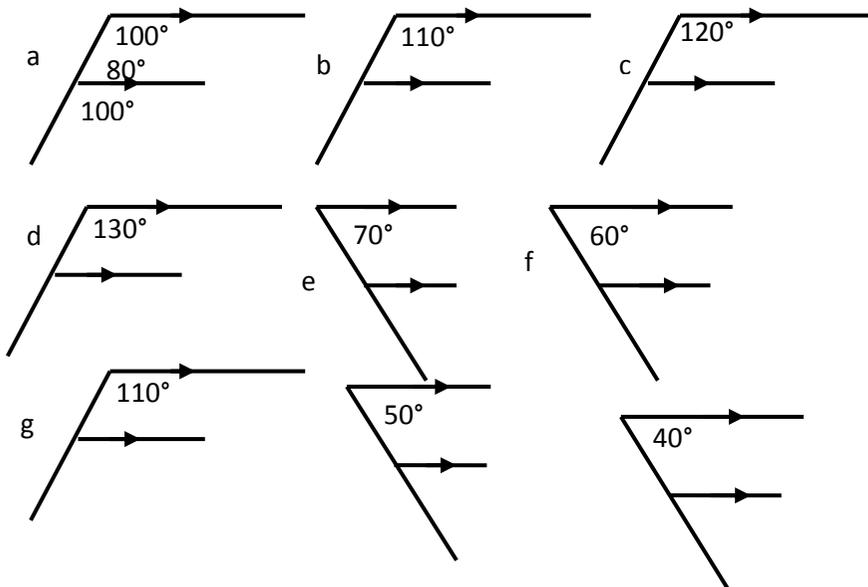
## Exercise 5 (C)

Copy the following diagrams into your jotter and fill in the sizes of all the angles.



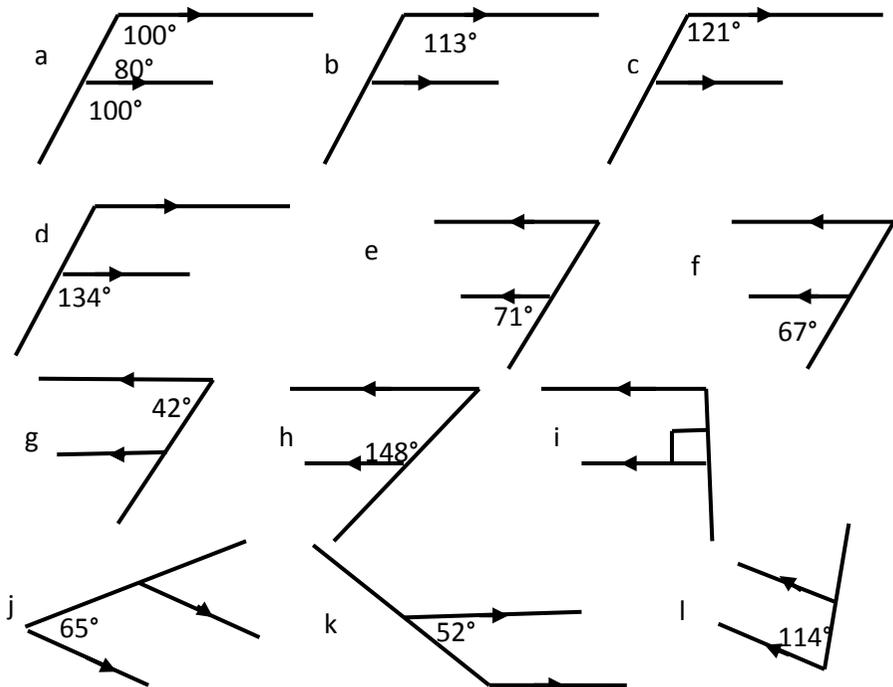
## Exercise 6 (A)

Copy the following diagrams into your jotter and fill in the sizes of all the angles. The first one has been done for you.



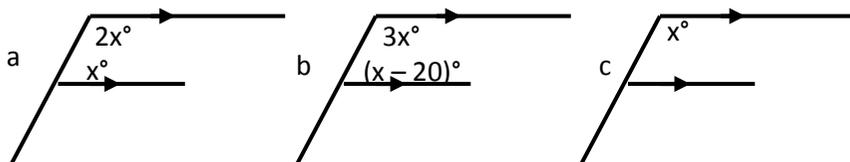
## Exercise 6 (B)

Copy the following diagrams into your jotter and fill in the sizes of all the angles. The first one has been done for you.



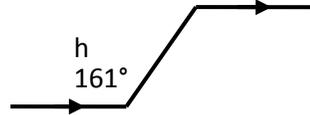
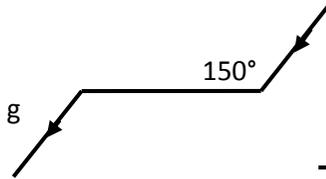
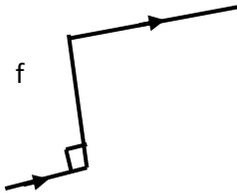
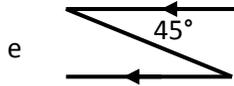
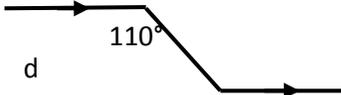
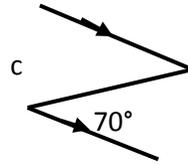
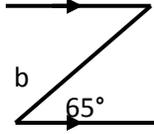
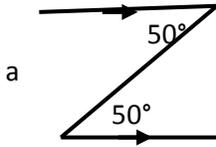
## Exercise 6 (C)

Copy the following diagrams into your jotter and fill in the sizes of all the angles.



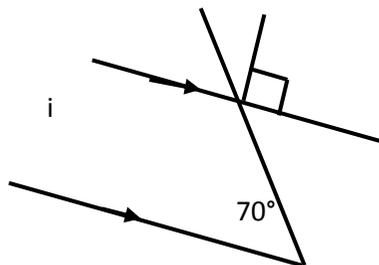
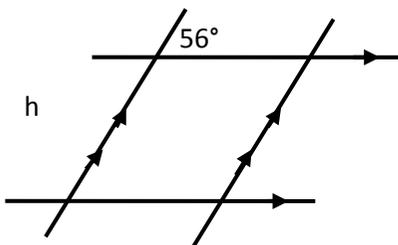
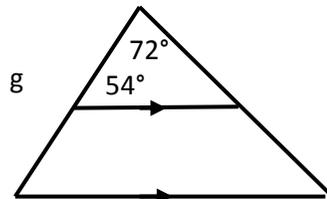
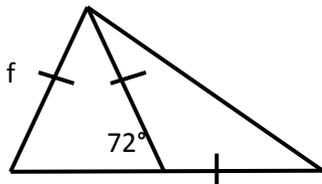
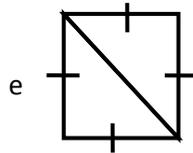
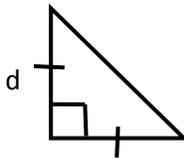
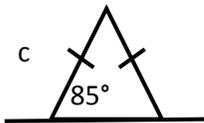
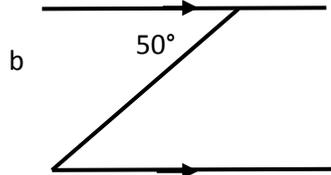
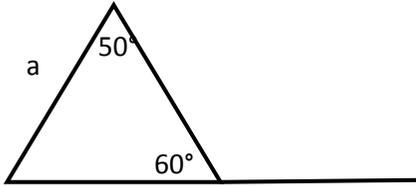
## Exercise 7 (B)

Copy the following diagrams into your jotter and fill in the sizes of all the angles. The first one has been done for you:-



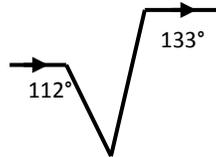
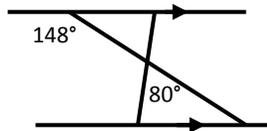
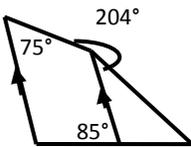
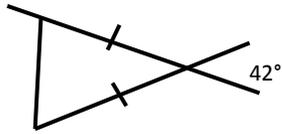
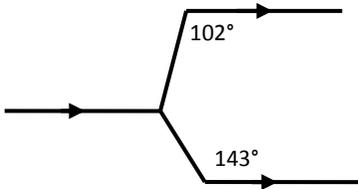
## Exercise 8 (B)

Copy the following diagrams into your jotter and fill in the sizes of all the angles:-



## Exercise 8 (C)

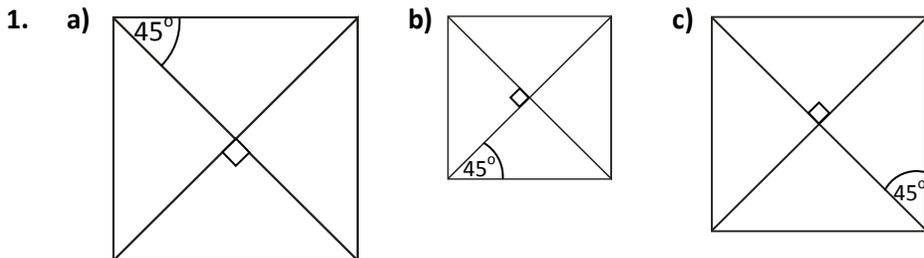
Make a copy of each diagram and fill in the sizes of all the angles:-



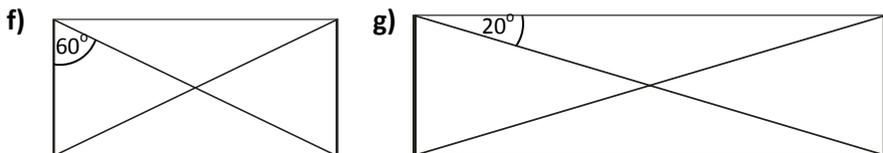
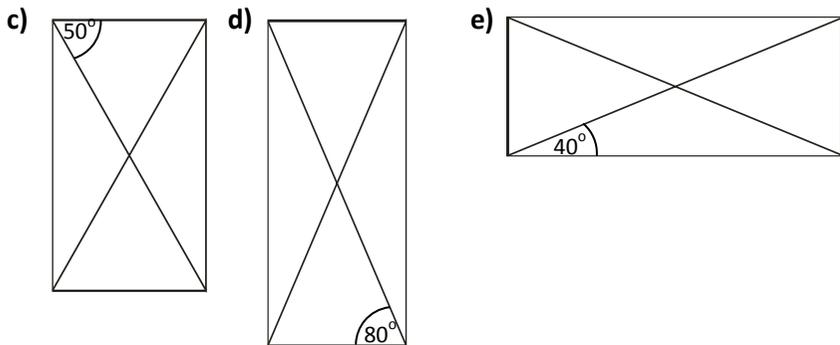
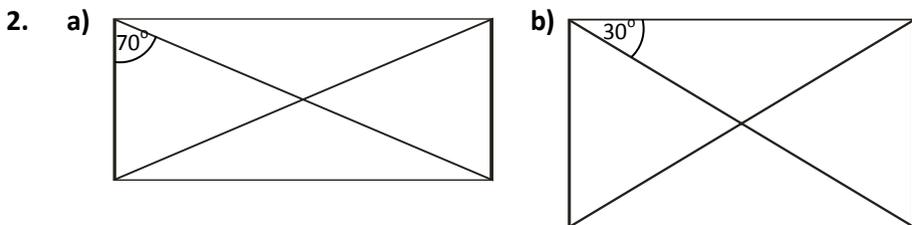
# Quadrilaterals

## Exercise 1 (A) – Squares and Rectangles.

Copy each diagram into your jotter and fill in ALL the angles you can.

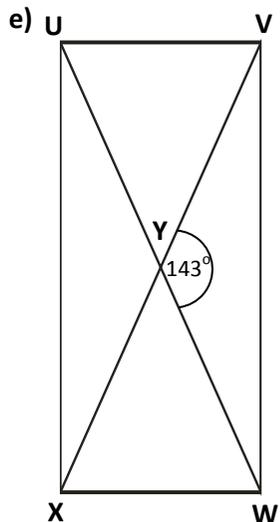
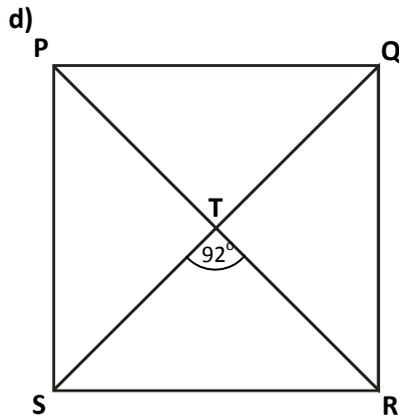
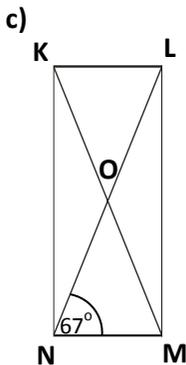
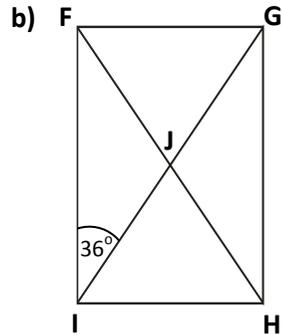
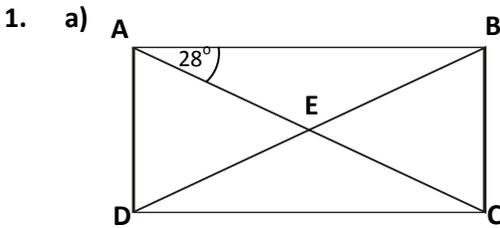


d) What do you notice about the angles in all of the diagrams above?



## Exercise 1 (B) – Squares and Rectangles.

Copy each diagram into your jotter and fill in ALL the angles you can.



2. From the above diagrams in Exercise 1 (B) state the following angle sizes:

a) angle  $CED$ .

f) angle  $ACD$ .

b) angle  $GHJ$ .

g) angle  $FJG$ .

c) angle  $KNL$ .

h) angle  $LOM$ .

d) angle  $QTR$ .

i) angle  $PST$ .

e) angle  $VWX$ .

j) angle  $WYX$ .

3. Draw a rectangle  $ABCD$  with diagonals  $AC$  and  $BD$  intersecting (crossing over) at the point  $E$ . Now fill in angle  $BAC$  as  $59^\circ$  and then fill in all the other possible angles.

## Exercise 1 (C) – Squares and Rectangles.

1. The rectangle ABCD below has angle  $BAC = 27^\circ$ . State the size of the following angles:

a) angle DAB.

b) angle DAC.

c) angle BED.

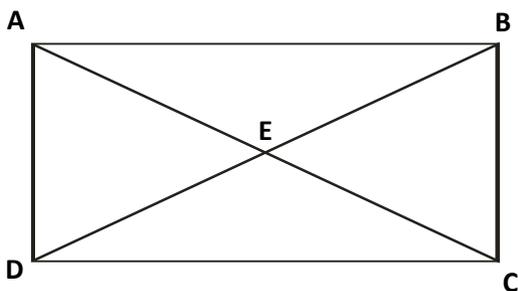
d) angle ABD.

e) angle AEB.

f) angle BEC.

g) angle BCE.

h) the reflex angle BCE.



2. The rectangle PQRS below has angle  $STR = 143^\circ$ . State the size of the following angles:

a) angle QTR.

b) angle TRS.

c) angle RPQ.

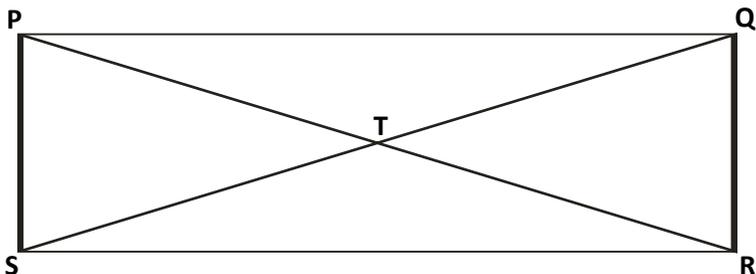
d) angle TPQ.

e) angle SPT.

f) angle PRQ.

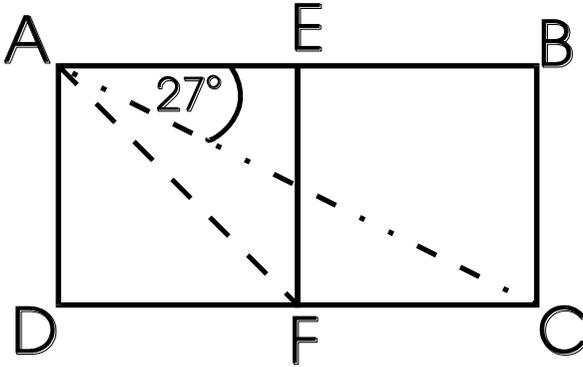
g) the reflex angle PRQ.

h) the reflex angle PTS



3. The diagram below shows two identical ("CONGRUENT") squares. State the size of the following angles:

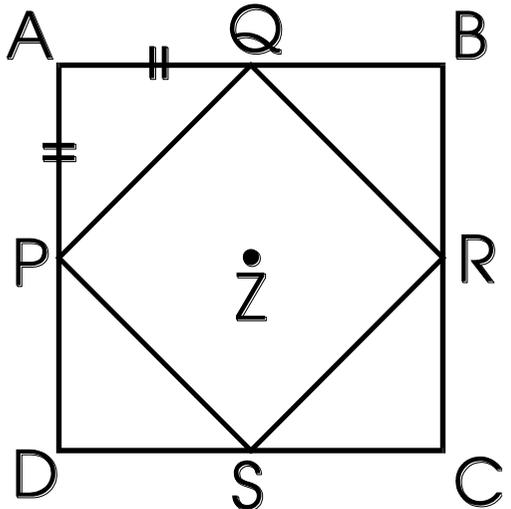
- a) angle ADF.
- b) angle DAF.
- c) angle CAF.
- d) angle ACF.
- e) angle AFC.
- f) the reflex angle ACB.
- g) the mathematical name for quadrilateral ABCD.



4. This diagram shows **two** squares ABCD and PQRS with a common centre Z.

State:

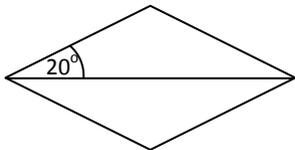
- a) the size of angle APQ.
- b) the size of angle DPS.
- c) the size of angle QPS.
- d) the size of angle APS.



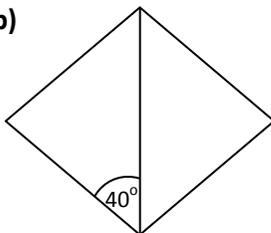
## Exercise 2 (A) – The Rhombus

Copy each diagram into your jotter and fill in ALL the angles you can.

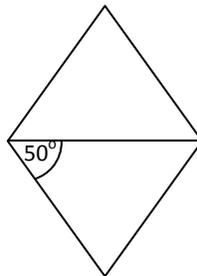
1. a)



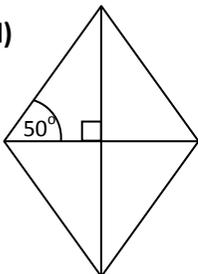
b)



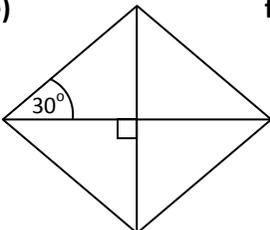
c)



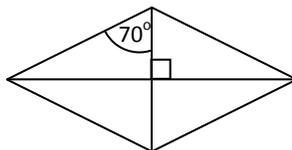
d)



e)

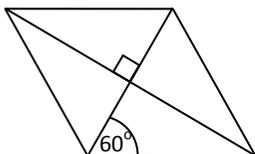


f)

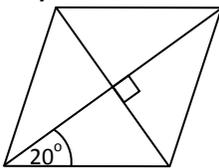


2. What do you notice about all the “middle” angles ?

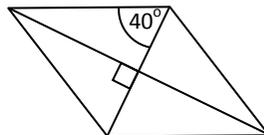
3. a)



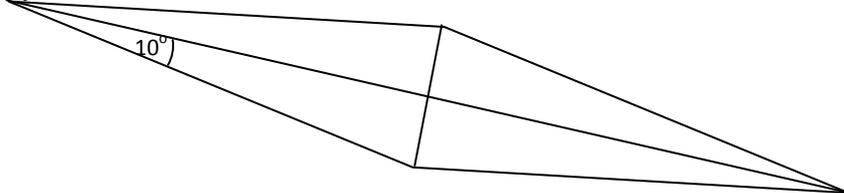
b)



c)



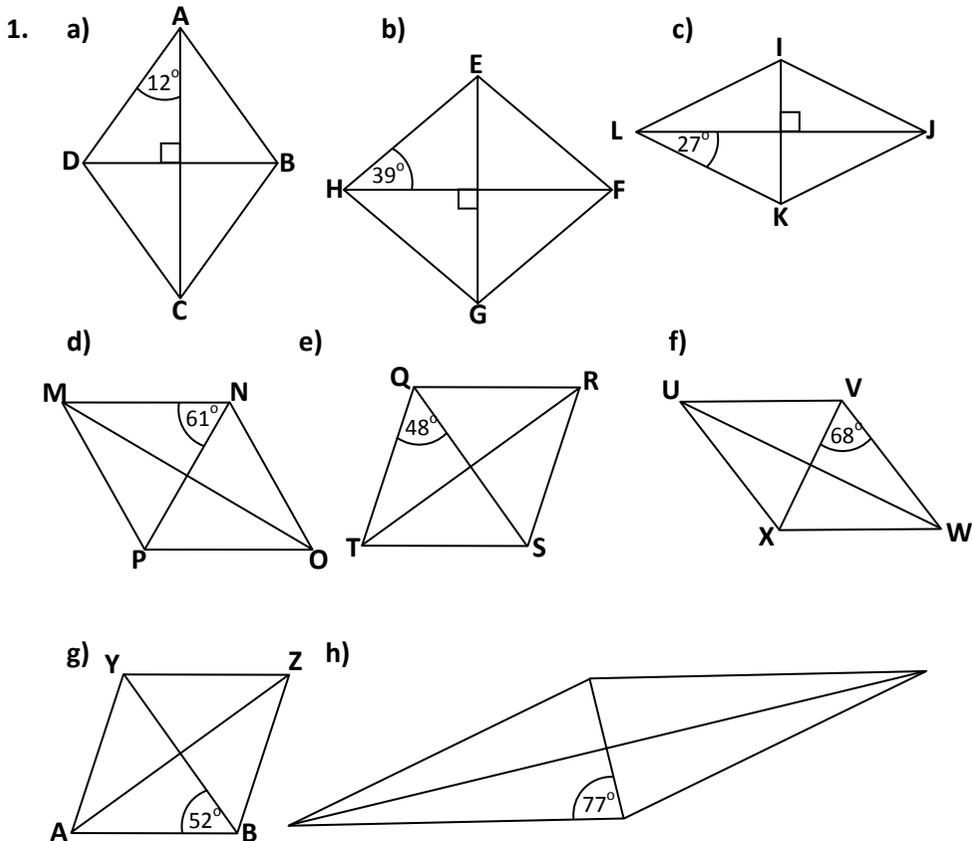
d)



4. Write down any other things you notice about the angles in a rhombus.

## Exercise 2 (B) – The Rhombus

Copy each diagram into your jotter and fill in ALL the angles you can.



- Discuss with your partner and write down 3 things you notice about the angles in a rhombus.
- From the above diagrams in Exercise 2 (B) state the following angle sizes:
 

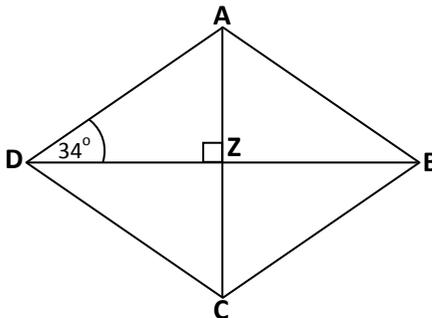
a) angle ADB.	f) angle QRT.
b) angle GFH.	g) angle QRS.
c) angle ILJ.	h) angle VUX.
d) angle MPN.	i) angle YZB.
e) angle MPO.	j) angle BAY.
- Draw a rhombus AEKN with diagonals AK and EN. If angle AEK =  $62^\circ$  fill in all the other possible angles.

## Exercise 2 (C) – The Rhombus

Copy each diagram into your jotter and fill in ALL the angles you can first, then answer the questions.

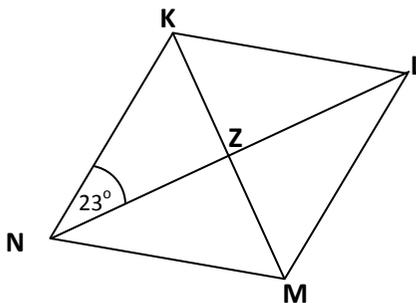
1. The rhombus ABCD below has angle BAZ =  $34^\circ$ . State the size of the following angles:

- angle BCZ.
- angle BZC.
- angle ABZ.
- angle BAD.
- angle ABC.
- angle ADC.
- the reflex angle ABC.



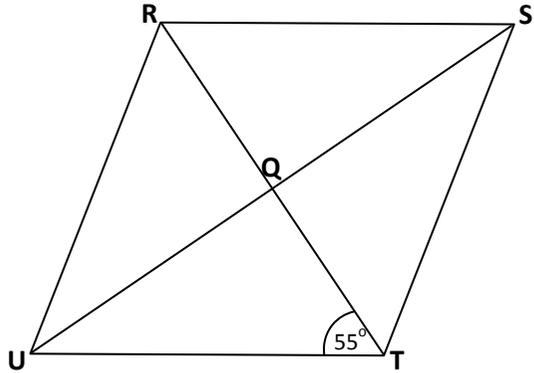
2. The rhombus KLMN below has angle KNL =  $23^\circ$ . State the size of the following angles:

- angle MZL.
- angle NKZ.
- angle ZLM.
- angle KLM.
- angle NML.
- angle reflex angle KNM.



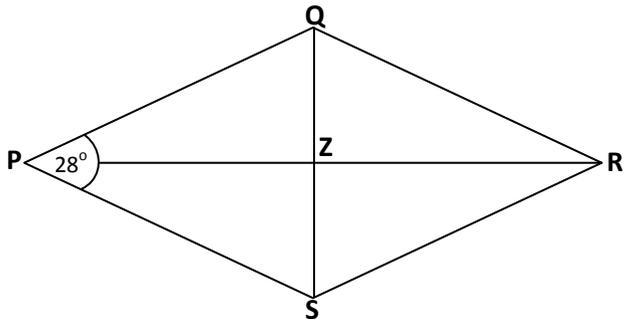
3. The rhombus RSTU below has angle QTU =  $55^\circ$ . State the size of the following angles:

- angle UQT.
- angle QTS.
- angle UTS.
- angle RUQ.
- angle RUT.
- angle RUS.
- the angle SQU.



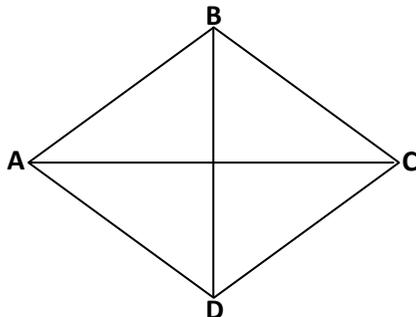
4. The rhombus PQRS below has angle QPS =  $28^\circ$ . State the size of the following angles:

- angle QZR.
- angle OPZ.
- angle PQZ.
- angle PQR.
- angle PSZ.
- angle PSR.
- angle ZRS.

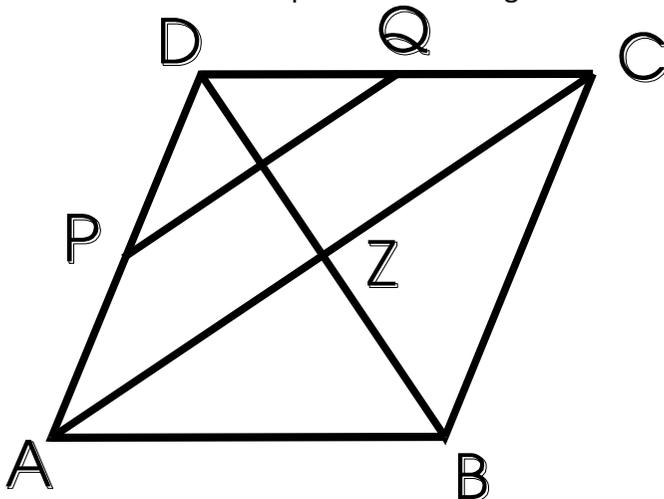


5. The rhombus ABCD below has angle BCD =  $68^\circ$ . State the size of the following angles:

- angle BAZ.
- angle BZA.
- angle BAD.
- angle ZBC.
- angle ADC.



6. ABCD is a rhombus. PQ is parallel to C. Angle BAD =  $82^\circ$ .

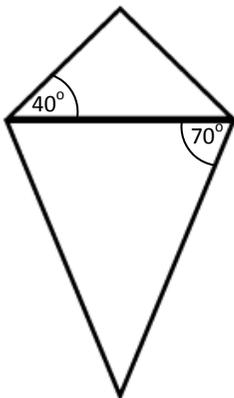


- (a)  $\hat{B}AZ =$   
 (b)  $\hat{A}ZB =$   
 (c)  $\hat{A}DZ =$   
 (d)  $\hat{D}CB =$   
 (e)  $\hat{A}BC =$   
 (f)  $\hat{D}PQ =$   
 (g)  $\hat{A}PQ =$

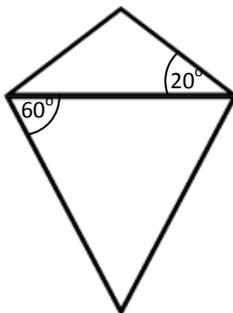
### Exercise 3 (A) – The Kite

Copy each diagram into your jotter and fill in ALL the angles you can.

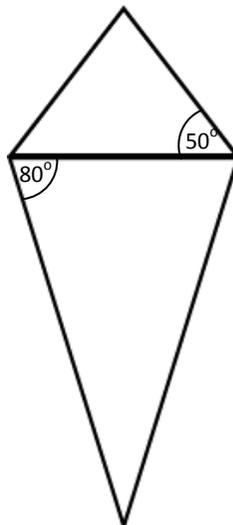
1. a)



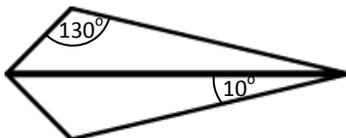
b)



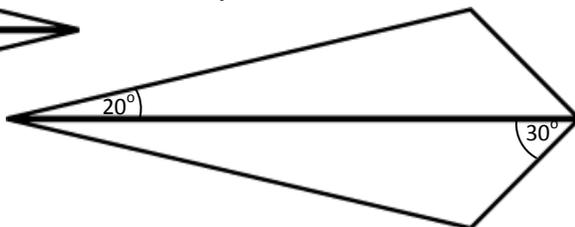
c)



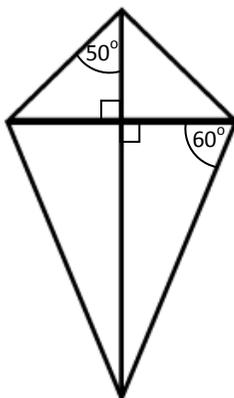
d)



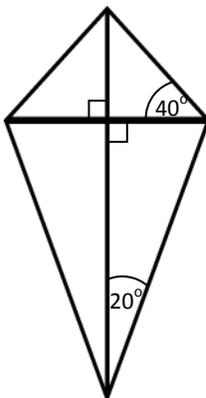
e)



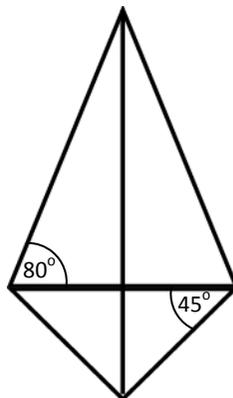
2. a)



b)



c)

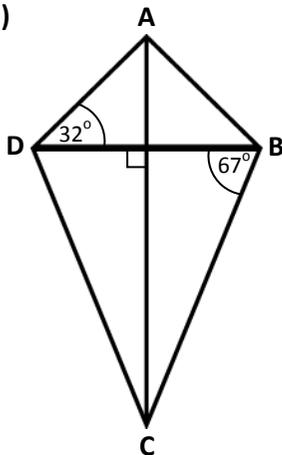


3. What do you notice about some of the angles across from each other?

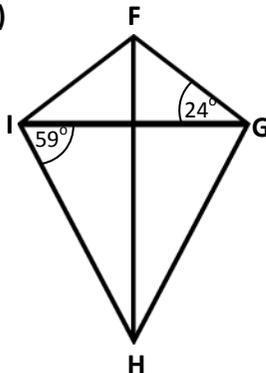
## Exercise 3 (B) – The Kite

Copy each diagram into your jotter and fill in ALL the angles you can.

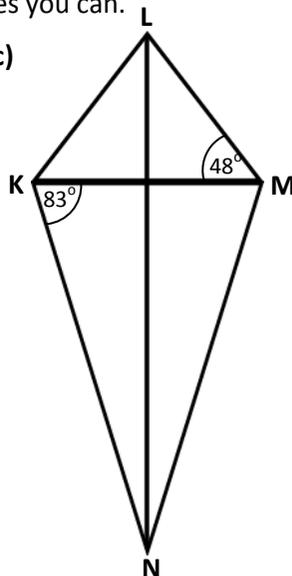
1. a)



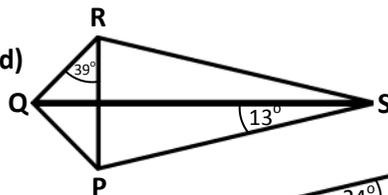
b)



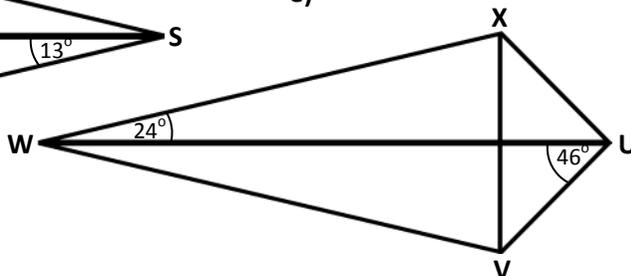
c)



d)



e)



2. Discuss with your partner and write down 3 things you notice about the angles in a kite.

3. From the above diagrams in Exercise 3 (B) state the following angle sizes:

a) angle BAC.

f) angle VUX.

b) angle GFH.

g) angle UXW.

c) angle LKN.

h) angle VUX.

d) angle KNM.

i) angle ADC.

e) angle QPS.

j) angle BCD.

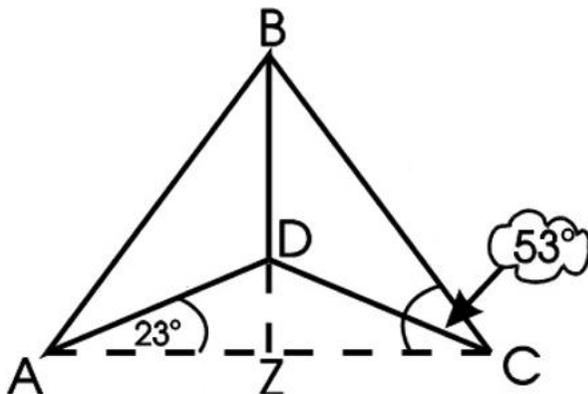
4. Draw a kite ABCD with diagonals AC and BD. If angle DCA =  $57^\circ$  and DAC =  $41^\circ$  fill in all the other possible angles.

### Exercise 3 (C) – The Kite

Copy each diagram into your jotter and fill in ALL the angles you can.

1. The kite ABCD below has angle  $BCA = 53^\circ$  and  $DAZ = 23^\circ$ . State the size of the following angles:

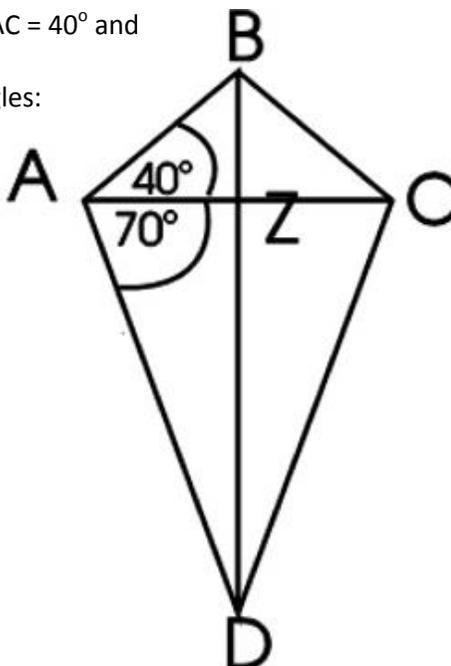
- angle AZB.
- angle ACD.
- angle BAD.
- angle ADZ.
- angle ADB.
- angle ADC.
- angle ABC.



2. The kite ABCD below has angle  $BAC = 40^\circ$  and  $DAZ = 70^\circ$ .

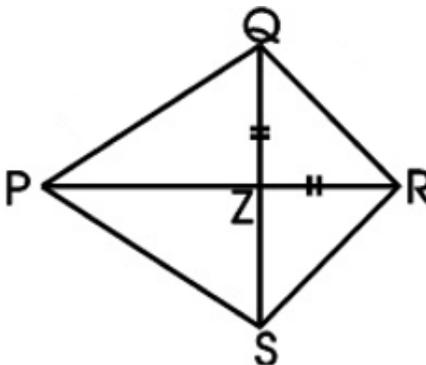
State the size of the following angles:

- angle AZB.
- angle ABZ.
- angle ABC.
- angle ZDC.
- angle ADC.
- angle BCD.
- the reflex angle BAD.
- the reflex angle ABC.



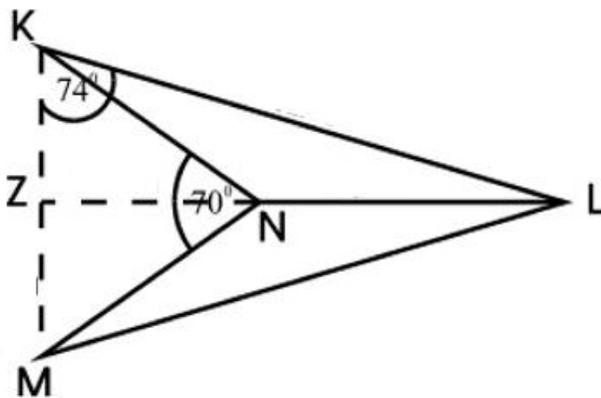
3. The kite PQRS below has angle  $SPQ = 64^\circ$ . Notice carefully what you are told about triangle QZR!  
State the size of the following angles:

- angle PZS.
- angle SPZ.
- angle PQZ.
- angle ZRS.
- angle ZRQ.
- angle PQR.
- the reflex angle PQR.
- the reflex angle QPS.



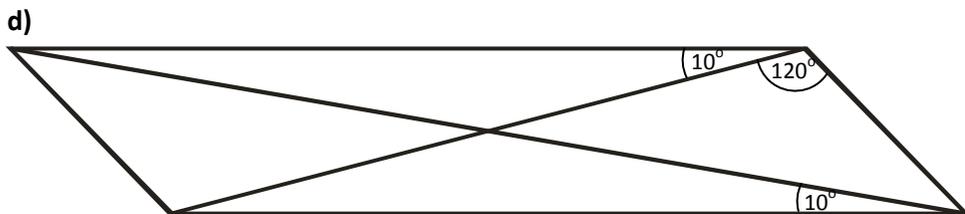
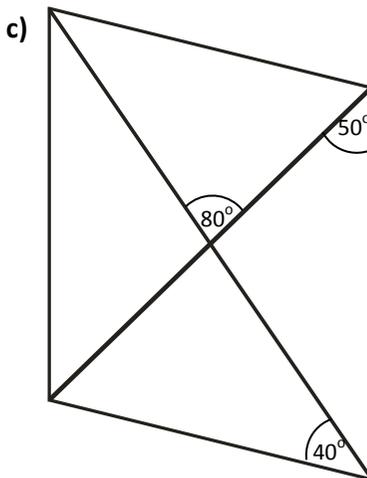
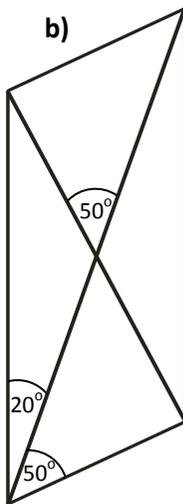
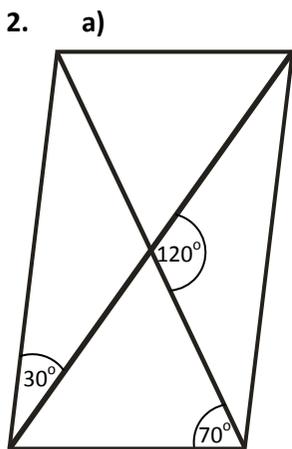
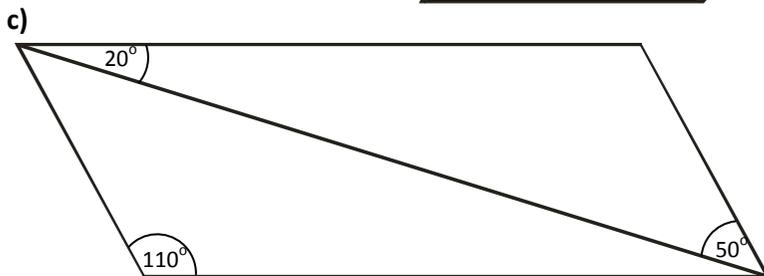
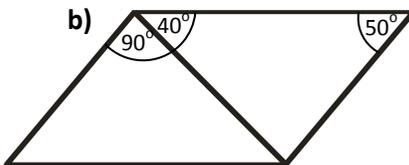
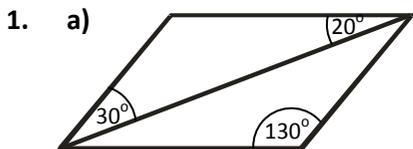
4. The kite KLMN below has angle  $LKZ = 74^\circ$  and  $KNM = 70^\circ$ .  
State the size of the following angles:

- angle KZN.
- angle ZKN.
- angle LNK.
- angle NML.
- angle KLM.
- the reflex angle KLM.
- the reflex angle LNK.



## Exercise 4 (A) – The Parallelogram

Copy each diagram into your jotter and fill in ALL the angles you can.

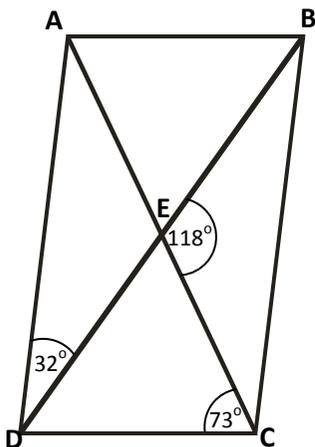


3. What do you notice about the angles in a parallelogram?

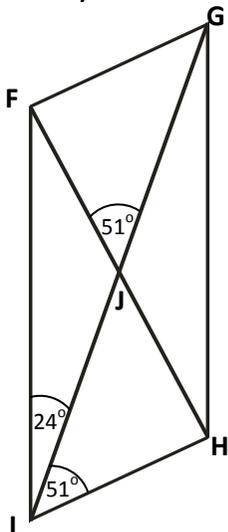
## Exercise 4 (B) – The Parallelogram

Copy each diagram into your jotter and fill in ALL the angles you can.

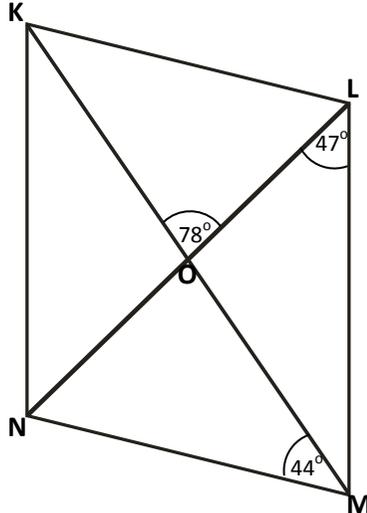
1. a)



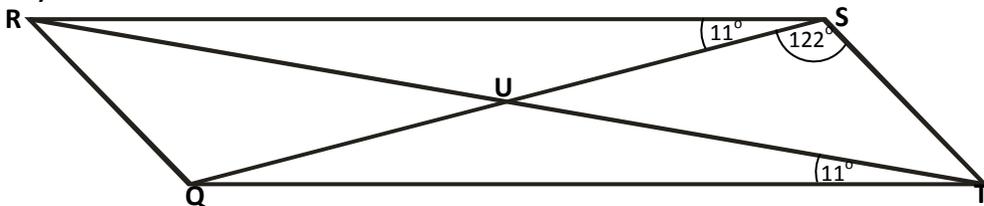
b)



c)



d)



2. From the above diagrams in Exercise 4 (B) state the following angle sizes:

a) angle  $ABC$ .

f) the reflex angle  $LOM$ .

b) angle  $ADC$ .

g) angle  $RQS$ .

c) angle  $GFI$ .

h) angle  $TQR$ .

d) angle  $GHI$ .

i) angle  $QUT$ .

e) angle  $LOM$ .

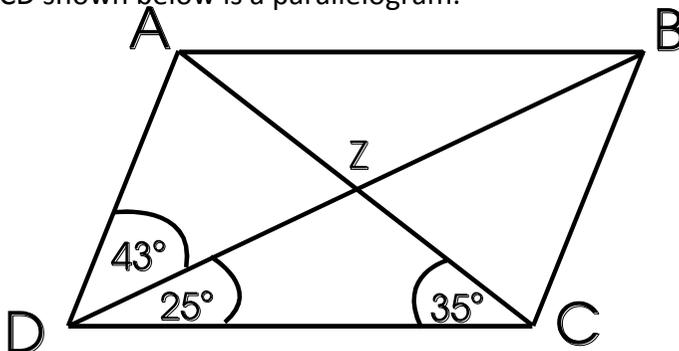
j) the reflex angle  $RUQ$ .

3. Discuss with your partner and write down 3 things you notice about the angles in a parallelogram.

### Exercise 4 (C) – The Parallelogram

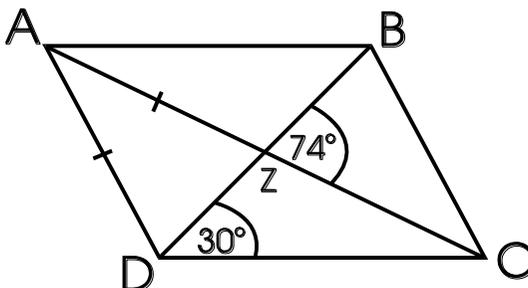
Copy each diagram into your jotter and fill in ALL the angles you can.

1. ABCD shown below is a parallelogram.



State the following angle sizes:

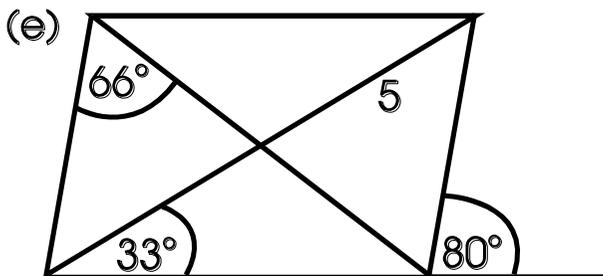
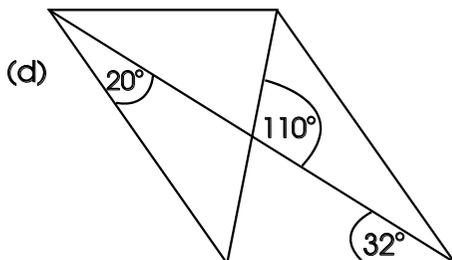
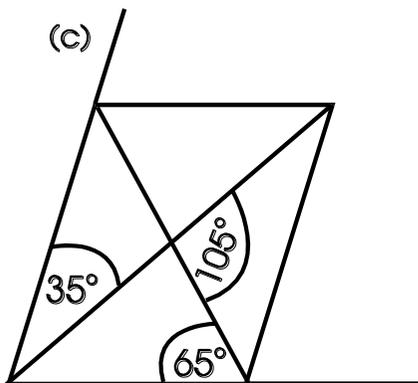
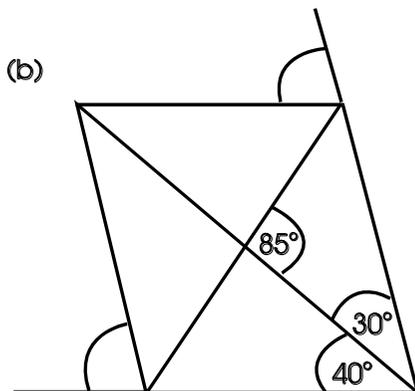
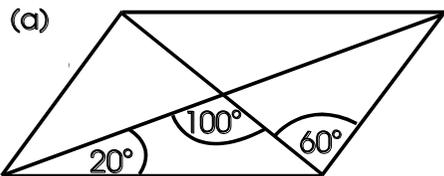
- |               |               |
|---------------|---------------|
| a) angle ABC. | e) angle BAZ. |
| b) angle DAB. | f) angle AZB. |
| c) angle ABD. | g) angle BZC. |
| d) angle DBC. | h) angle DZC. |
2. (HINT: Look carefully at triangle AZD) ABCD is a parallelogram.



State the following angle sizes:

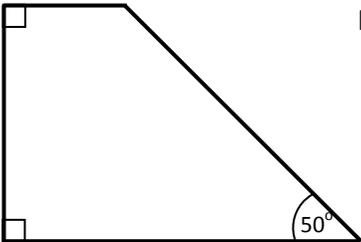
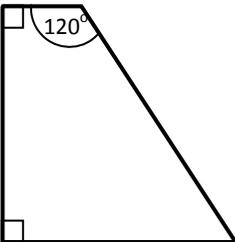
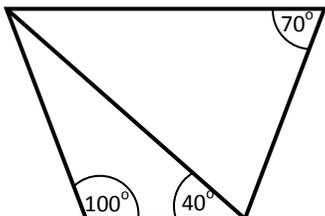
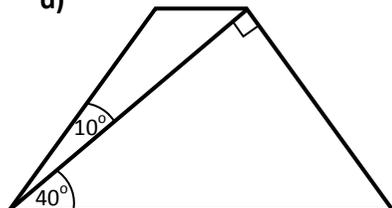
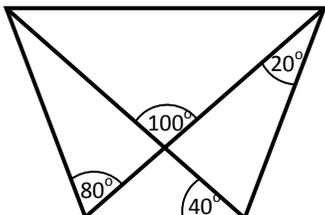
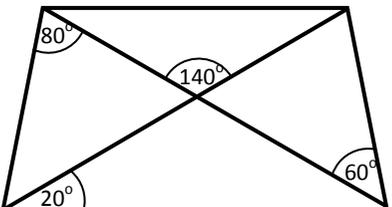
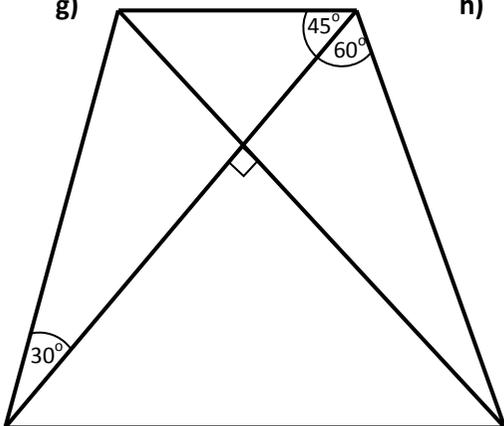
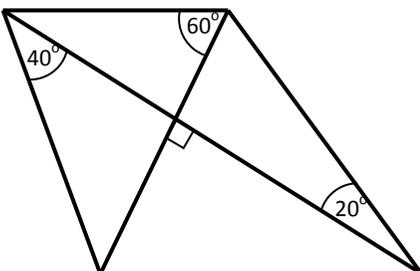
- |               |               |
|---------------|---------------|
| a) angle AZD. | e) angle ZAB. |
| b) angle ADZ. | f) angle DAB. |
| c) angle DAZ. | g) angle DZC. |
| d) angle ABC. | h) angle ZCD. |

3. The diagrams below all show a parallelogram. Copy each diagram into your jotter and then fill in the sizes of all angles.



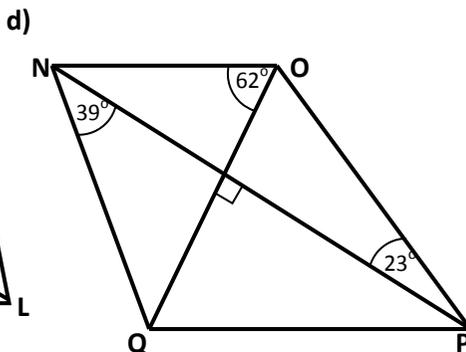
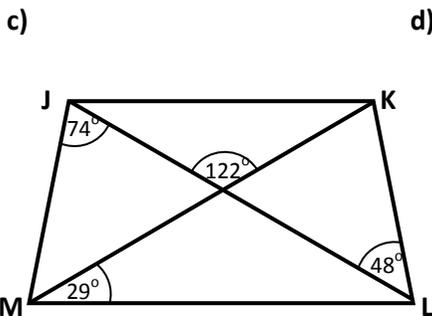
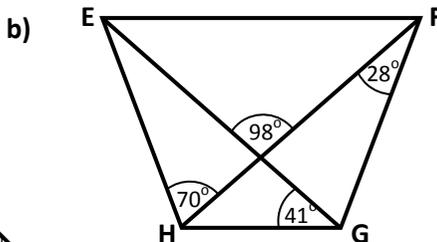
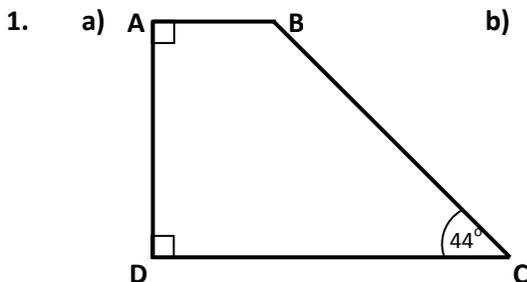
## Exercise 5 (A) – The Trapezium

Copy each diagram into your jotter and fill in ALL the angles you can.

1. a) 
- b) 
- c) 
- d) 
- e) 
- f) 
- g) 
- h) 

## Exercise 5 (B) – The Trapezium

Copy each diagram into your jotter and fill in ALL the angles you can.



2. From the above diagrams in Exercise 5 (B) state the following angle sizes:

a) angle ABC.

f) the reflex angle ABC.

b) angle EHF.

g) angle EFG.

c) angle LKM.

h) angle JKL.

d) angle NPQ.

i) angle OPQ.

e) angle JLM.

j) the reflex angle NQP.

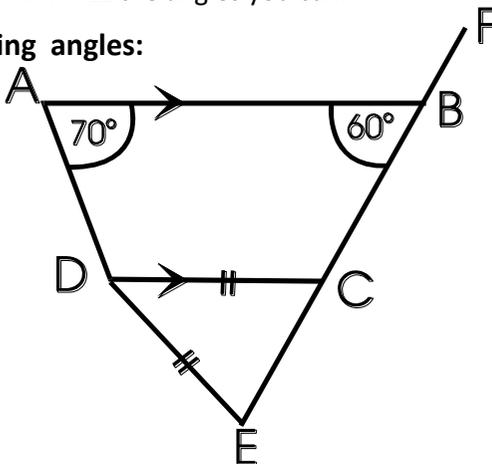
3. Discuss with your partner and write down 3 things you notice about the angles in a trapezium.

## Exercise 5 (C) – The Trapezium

Copy each diagram into your jotter and fill in ALL the angles you can.

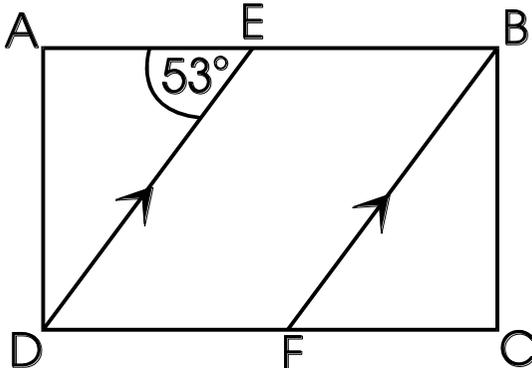
1. State the sizes of the following angles:

- a) angle DCE =
- b) angle DCB =
- c) angle ADC =
- d) angle ABF =
- g) angle EDC =



2. ABCD is a RECTANGLE. DE is parallel to FB.

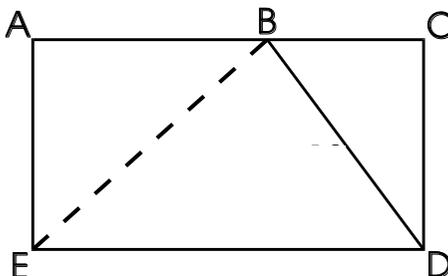
- a) angle DEB =
- b) angle EBF =
- c) angle CBF =
- d) angle CFB =



3. angle AEB =  $48^\circ$ , angle BDC =  $37^\circ$ .

a) ABDE is a TRAPEZIUM. Name the other TRAPEZIUM.

- b) angle ABE =
- c) angle CBD =
- d) angle EBD =
- e) angle BED =



# Mean (Average)

## Exercise 1 (A)

Calculate the **average (mean)** of:

**a** 5, 6, 10

**b** 4, 5, 6, 9

**c** 4, 6, 5, 25

**d** 8, 8, 10, 14

**e** 8, 9, 9, 24

**f** 5, 7, 10, 11, 14

**g** 12, 42, 53, 55, 59

**h** £3, £7, £20

**i** £5·20, £7·60, £12·32, £12·08

**j** 60p, 68p, 95p, 125p

**k** £0.80, £2, £3·20, £5

**l** 5m, 5m, 5m, 5m, 40m

**m** 8kg, 10kg, 12kg

**n** 3·4m, 6·2m, 4·1m, 3·3m

**o** 12, 15, 16, 16, 18

**p** 4g, 4g, 5g, 5g, 5g, 6g, 7g, 7g, 9g, 9g, 9g, 9g, 10g

**q** £54, £56, £60, £65, £73, £74, £85, £89, £91, £95

**r** 0.3m, 0.42m, 0.63m, 0.75m, 0.84m, 1.2m, 1.38m, 2.16m

**s** \$42, \$18, \$36, \$86, \$94, \$24, \$141, \$28, \$87, \$36, \$143, \$72, \$4, \$99, \$5

**t** 312km, 547km, 436km, 562km, 835km, 642km, 173km

## Exercise 1 (B)

Find the **mean** of:

**a** 1kg, 0·5kg, 0·25kg, 0·14kg, 0·06kg

**b** 7,9,6,12,0,5,4,5

**c** 2·2, 5·7, 12·8, 6·7, 2·1

**d** 7, 7, 8, 9, 9, 9, 9, 10, 11, 11, 12, 15, 15, 15, 15, 15, 16

**e** 6·4, 5·2, 1·8, 3·4, 9·4, 7·2, 8·1, 5·5, 0·6, 1·1, 1·6, 2·4, 2·7, 7·2, 8·7, 10·5

**f** £3·12, £9·50, 64p, £8, £12·06, £11, 98p, 63p, £41, £20·05

**g** 6m, 8·5m, 65cm, 2·4m, 31cm, 50cm, 3·6m, 7·3m, 90cm, 20cm

**h** 7, 9, 15, 6, 18, 5, 8, 27, 14, 16, 7

**i** £2.10, £3.45, 67p, £1.47, 83p, 65p, £5.21, £4.18

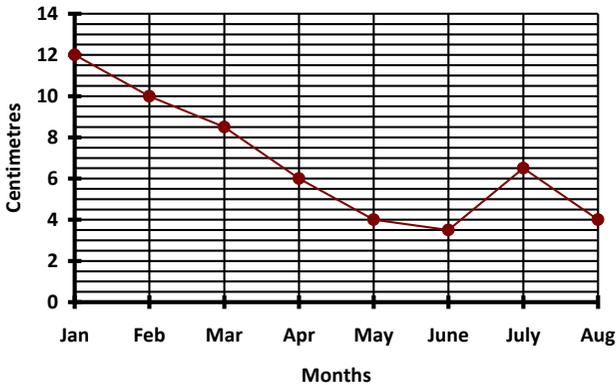
**j** 65, 36, 79, 43, 67, 58, 88, 95, 35, 24, 67, 67, 42, 29, 54, 32, 47, 32, 65, 75

- k 23, 57, 67.4, 28.84, 42.7, 49.39, 38, 72, 54.3, 43.17
- l 45cm, 1.2m, 4.5m, 37cm, 1.48cm, 2.11m, 2.03m, 46cm, 1.44m
- m 4.8kg, 3.6kg, 954g, 2.348kg, 3.7kg, 258g
- n 4 days, 5 days, 2 weeks, 5 days, 3 weeks, 2 days, 5 days
- o 1,1,1,1,1,1,2,2,2,2,2,3,3,3,3,3,4,4,4,4,5,5,5,5,6,6,7,7,7,7,8,8,8,8,9

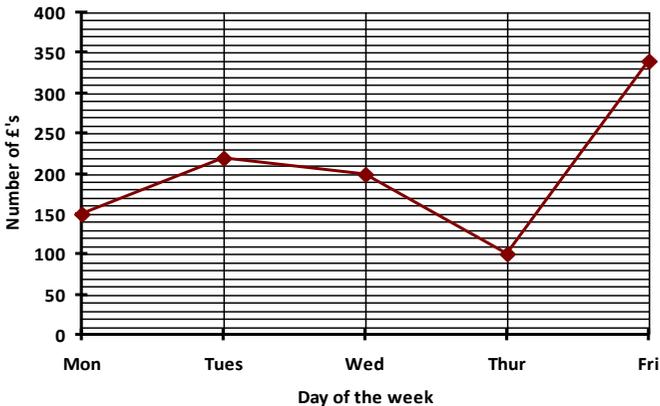
## Exercise 1 (C)

- 1 The weights of 5 males are 7.25kg, 19.75kg, 14.65kg, 2.35kg and 72kg.
  - a Find their mean weight.
  - b Which one is a baby?
  - c Which one (apart from the baby) is probably less than 1 year old?
  
- 2 The distances travelled by a car on 5 days were: 68km, 156km, 91km, 162km and 99km. Find:
  - a the mean distance travelled.
  - b the number of litres of petrol used during the 5 days if the fuel consumption of the car was 9km/litre.
  
- 3 The mean price of 12 records is £2.75.
  - a What is the **TOTAL** price of the 12 records?
  - b If 2 of the records were LP's costing £6 each, calculate the mean price of the remaining 10.
  - c If 6 of the remaining 10 were 'singles' costing £1 each and the other 4 were LP's costing the same price each, how much did **each** of these 4 LP's cost?

- 4 This graph shows the amount, in centimetres, of rainfall for 8 months of the year.



- Find the mean rainfall to the nearest centimetre.
  - Which months have above mean rainfall?
  - Which months have below mean rainfall?
- 5 The graph gives the daily takings of a shop over a period of 5 days.



- What were the mean daily takings?
- Which days were above the mean?
- Which days were below the mean?
- Suggest why Thursday had the lowest takings?

- 6 This table shows the wages earned by employees of a certain firm:

NAME	Mr Jones	Mrs White	Mr Green	Mr Little	Mr Hokes
Wages	£130	£100	£200	£80	£150

What is their mean wage?

- 7 Here is a table which gives the train times from Park Green to Hope Grove

LEAVE Park Green	7.45 am	8.30 am	9.26 am	10.18 am
ARRIVE Hope Grove	8.00 am	8.50 am	9.53 am	10.32 am

- a Find the mean time for the journey.  
b Can you say why the time for the journey varies?
- 8 The table shows the number of hours that a group of students watched TV one weekend.

Number of hours viewing	2	3	4	5	6	7
Number of students	4	5	7	9	10	7

- a How many students were there?  
b Calculate the mean number of hours viewed per student.
- 9 The mean height of 4 pupils was 152cm. When a fifth pupil joins the group the mean height is increased by 2cm. What is the height of the fifth pupil?
- 10 In a class of 12 boys and 18 girls at a certain examination the boys' mean mark was 54 and the girls' mean mark was 62. Find the mean mark for the whole class.
- 11 There are 40 pupils in a class. Their mean mark in an examination is 55. If the 25 boys in the class have a mean mark of 58, find the mean mark of the girls.
- 12 A class of 20 pupils has a mean age of 12 years. Four pupils whose mean age is  $12\frac{1}{2}$  years leave and 6 pupils whose mean is  $10\frac{1}{2}$  years join the class find the new mean age of the pupils in the class.
- 13 The mean weight of 8 babies in a ward is 3.2kg. 3 babies whose mean weight is 3.9kg leave the ward and 4 babies whose mean weight is 3.1kg join the ward. What is the new mean weight of the babies in the ward?
- 14 There are 26 pupils in a class. Their mean mark in an examination is 92. If the 14 boys in the class have a mean mark of 88, find the mean mark of the girls.
- 15 The mean height of 10 kids in a youth club is 114cm. 2 kids whose mean weight is 110cm leave the club and 6 kids whose mean height is 124cm join the club. What is the new mean weight height of the pupils in the club?