



**Mathematics Enhancement Programme  
Demonstration Project**

# **Practice Book**

## **Certificate of Educational Achievement Year 10**

This is one component of MEP Mathematics resources for Y10 and Y11.

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# 1 Number Concepts 1

## 1.1 Number Language

1. Write as a number

- |                                 |                                  |
|---------------------------------|----------------------------------|
| (a) twenty four                 | (b) eighty one                   |
| (c) thirty                      | (d) one hundred                  |
| (e) one hundred and forty three | (f) two hundred and twenty       |
| (g) forty nine                  | (h) three hundred and fifty five |
| (i) sixty seven                 | (j) nine hundred and ninety nine |
| (k) eight hundred and six       | (l) seventy six                  |
| (m) six hundred and fifty       | (n) four hundred and thirty two  |

2. Write in words

- |         |         |         |         |
|---------|---------|---------|---------|
| (a) 25  | (b) 79  | (c) 40  | (d) 99  |
| (e) 132 | (f) 250 | (g) 374 | (h) 500 |
| (i) 111 | (j) 907 | (k) 725 | (l) 870 |

3. Write each of these as a number

- (a) seventy five
- (b) thirty nine
- (c) fifty
- (d) twelve

and then put them in order, starting with the smallest.

4. What are the missing numbers?

- |                           |                          |
|---------------------------|--------------------------|
| (a) 10, 20, ... 40, ...   | (b) 5, ... 15, 20, ...   |
| (c) 50, 100, ... 200, ... | (d) 100, 110, ... .. 140 |
| (e) 2, 4, 6, ... ..       | (f) 20, 40, ... 80, ...  |
| (g) 100, ... 300, ... 500 | (h) 100, 90, ... .. 60   |

## 1.2 Ordering Numbers

- Put these numbers in size order. Start with the *smallest*.
  - 9, 2, 4, 8, 5
  - 12, 17, 14, 19, 10
  - 15, 7, 13, 1, 20
  - 18, 6, 2, 16, 11
  - 70, 30, 50, 10, 90
  - 25, 12, 32, 7, 41
  - 72, 31, 84, 9, 90
  - 35, 94, 43, 19, 52
- Put these numbers in size order. Start with the *largest*.
  - 20, 17, 8, 12, 5
  - 26, 52, 72, 13, 29
  - 11, 53, 65, 37, 45
  - 23, 39, 17, 84, 79
- Here are some sets of numbers. For each set, write down the
  - largest
  - smallestnumber in the set.
  - 72, 100, 57, 22, 6
  - 27, 92, 57, 89, 61
  - 21, 12, 3, 20, 29
  - 19, 21, 32, 8, 29
- In the number 352, the digit 5 has the value 5 tens, or 50.  
What is the value of 7 in each of the following numbers?
  - 72
  - 167
  - 721
  - 170
- A shop has the following cheques. Put them in order with the largest first.  
£20, £37, £12, £6, £90, £53, £30, £2
- Using all the digits 7, 3 and 5, the smallest number that can be formed is 357 and the largest is 753.  
For each set of digits below, write down the smallest and largest number that can be formed.
  - 5, 8, 3
  - 7, 1, 9
  - 8, 2, 8

## 1.3 Addition and Subtraction

1. Calculate

(a)  $12 + 8$

(b)  $25 + 7$

(c)  $32 + 11$

(d)  $24 + 24$

(e)  $15 + 26$

(f)  $47 + 29$

(g)  $47 + 52$

(h)  $76 + 43$

(i)  $57 + 87$

(j)  $57 + 100$

(k)  $125 + 80$

(l)  $237 + 122$

(m)  $176 + 250$

(n)  $427 + 383$

(o)  $197 + 254$

2. Calculate

(a)  $12 - 8$

(b)  $25 - 7$

(c)  $32 - 11$

(d)  $24 - 24$

(e)  $26 - 15$

(f)  $47 - 29$

(g)  $52 - 47$

(h)  $76 - 43$

(i)  $87 - 57$

(j)  $100 - 57$

(k)  $129 - 80$

(l)  $237 - 122$

(m)  $250 - 176$

(n)  $427 - 383$

(o)  $254 - 197$

3. I have the following coins in my bag:

20p, 10p, 50p, 2p, 2p, 10p, 1p, 5p.

Add these up to find the total value of the coins.

4. I spent 40p on sweets and 35p on a drink. How much did these cost me?

What change did I get from a £1 coin?

5. I spent 70p on a bag of chips, 35p on a sausage and 45p on a pie.

How much was my total bill?

I gave the cashier two £1 coins. How much change did I get?

6. My bus fare to school was 60p and I spent 95p on my lunch and 35p on a drink.

How much change from £2 did I take home?

## 1.4 Comparing Numbers

1. The rainfall for the month of July last year in different resorts in the UK was

Brighton	6 mm	Blackpool	12 mm
Skegness	4 mm	Scarborough	6 mm
Llandudno	15 mm	Torquay	13 mm

- Which resort had the smallest amount of rain?
- Which resort had the largest amount of rain?
- What is the difference between the smallest and largest amount of rain?
- How much more rain was there in Torquay than in Scarborough?

2. The midday temperatures at 4 cities around the world are

LONDON	25 °C	MOSCOW	15 °C
NEW YORK	27 °C	SINGAPORE	33 °C

- Which city has the highest midday temperature?
- Which city has the lowest midday temperature?
- What is the difference in temperature between the highest and lowest?
- What is the difference between midday temperatures in London and Singapore?

3. The heights of four boys and four girls are given below.

<i>Boys</i>		<i>Girls</i>	
John	176 cm	Sarah	159 cm
Peter	182 cm	Joan	163 cm
Ali	162 cm	Morag	153 cm
Jim	165 cm	Lisa	161 cm

- Who is the tallest?
- Who is the tallest girl?
- Who is the shortest?
- What is the difference between the heights of the shortest boy and the shortest girl?
- What is the difference between the heights of the tallest girl and the shortest boy?

## 1.5 Multiplication and Division

1. Calculate

(a)  $4 \times 3$

(b)  $2 \times 5$

(c)  $6 \times 6$

(d)  $8 \times 3$

(e)  $10 \times 6$

(f)  $3 \times 20$

(g)  $15 \times 2$

(h)  $2 \times 10$

(i)  $3 \times 3$

(j)  $4 \times 50$

(k)  $5 \times 4$

(l)  $3 \times 30$

2. Calculate

(a)  $20 \div 5$

(b)  $42 \div 7$

(c)  $25 \div 5$

(d)  $12 \div 4$

(e)  $40 \div 8$

(f)  $100 \div 5$

(g)  $32 \div 8$

(h)  $25 \div 5$

(i)  $200 \div 20$

(j)  $400 \div 10$

(k)  $900 \div 30$

(l)  $500 \div 50$

3. Find the cost of 5 tickets to a football match when each ticket costs £3.

4. You buy 3 tickets at £4 each and 2 tickets at £5 each. What is the total cost?

5. Tom saved three times as much as Ann. If Ann saved £12, how much did Tom save?

6. If bananas cost 40p per lb, how much will 3 lbs cost?

7. 3 litres of fresh orange juice cost 99p. How much does 1 litre cost?

8. For a school play, 25 chairs were placed in each of 8 rows.

(a) How many chairs were there?

(b) If 11 chairs were empty, how many people went to the play?

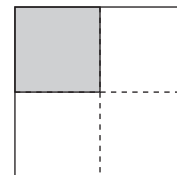
9. What is the difference between  $5 \times 4$  and  $3 \times 5$ ?
10. Write down the missing numbers in the equations.
- |                     |                       |
|---------------------|-----------------------|
| (a) $10 - ? = 4$    | (b) $5 \times ? = 35$ |
| (c) $? \div 5 = 6$  | (d) $16 \div ? = 4$   |
| (e) $12 \div ? = 3$ | (f) $15 \div ? = 5$   |
| (g) $? \div 2 = 10$ | (h) $6 \times ? = 12$ |
| (i) $20 - ? = 6$    | (j) $14 + ? = 19$     |

## 1.6 Fractions: Halves and Quarters

For this section, you will need to be familiar with the following fractions.

One square out of four is shaded.  
This is a *quarter* of the whole shape.

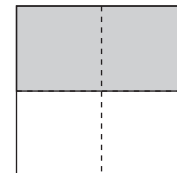
*quarter* or  $\frac{1}{4}$



One out of four is a *quarter*.

Two squares out of four are shaded.  
This is two quarters, or *half* of the whole shape.

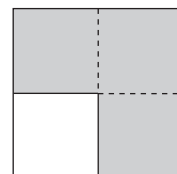
*half* or  $\frac{1}{2}$



Two out of four is a *half*.

Three squares out of four are shaded.  
This is *three quarters* of the whole shape.

*three quarters* or  $\frac{3}{4}$

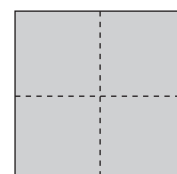


Three out of four is *three quarters*.

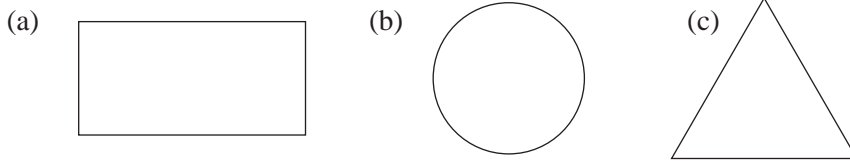
All four quarters are shaded.

Four out of four is one whole.

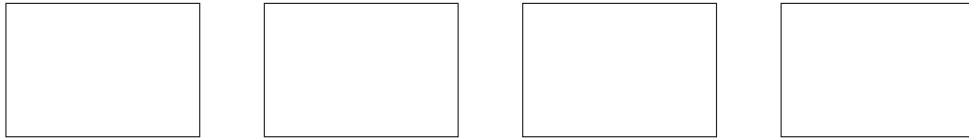
*one whole* or  $\frac{4}{4}$



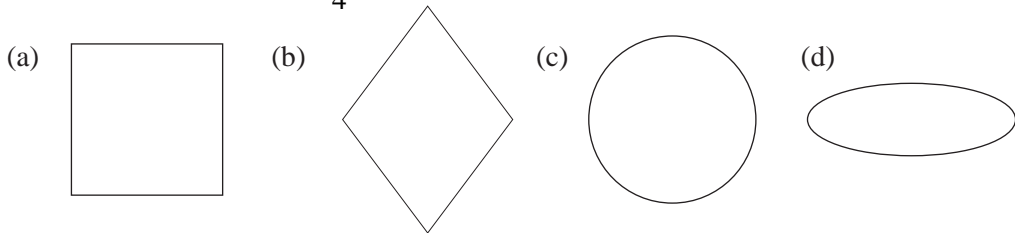
1. Copy the following shapes. Draw a line on each shape to divide it into two halves.  
Now shade one half of each of your shapes.



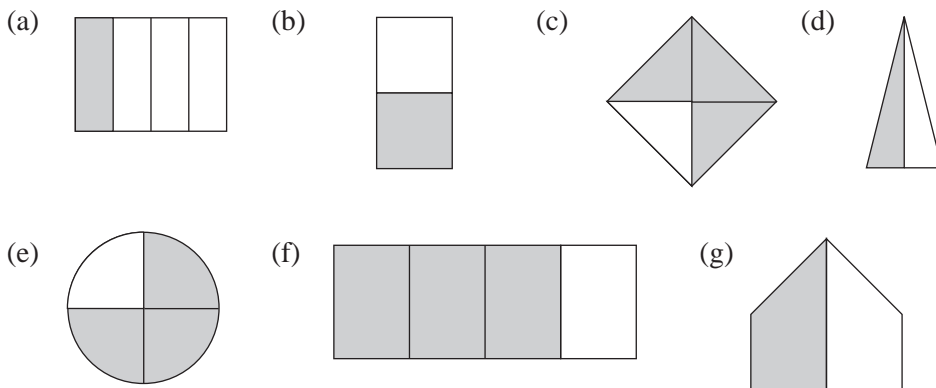
2. Draw four rectangles like the ones below. By drawing just *one* straight line on each rectangle, show 4 different ways of dividing a rectangle into two halves.



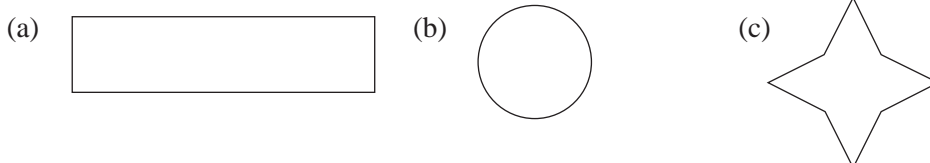
3. Copy these shapes. Shade  $\frac{1}{4}$  of each of the shapes you have drawn.



4. What fraction of each of the shapes is shaded?

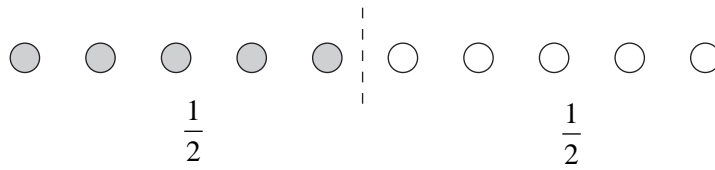


5. Copy these shapes. Shade  $\frac{3}{4}$  of each of the shapes you have drawn.



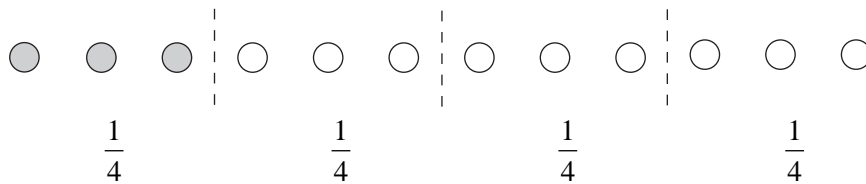
**Example**

- (a) Find a half of 10.



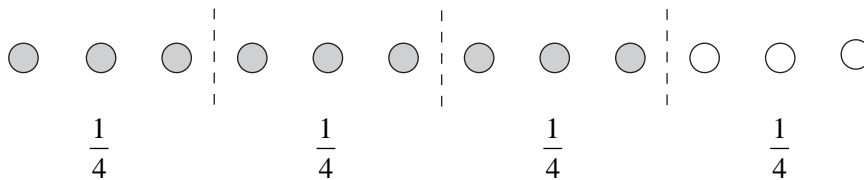
This shows the answer is 5.

- (b) Find a quarter of 12.



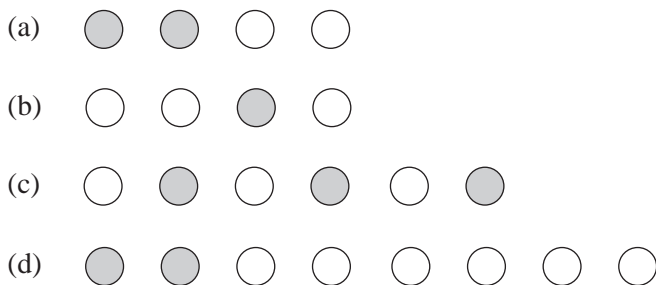
This shows the answer is 3.

- (c) Find  $\frac{3}{4}$  of 12.



This shows the answer is 9.

6. What fraction of the total number of circles is shaded?



7. What is

- (a)  $\frac{1}{2}$  of 8      (b)  $\frac{1}{4}$  of 8      (c)  $\frac{1}{2}$  of 16      (d)  $\frac{3}{4}$  of 12?

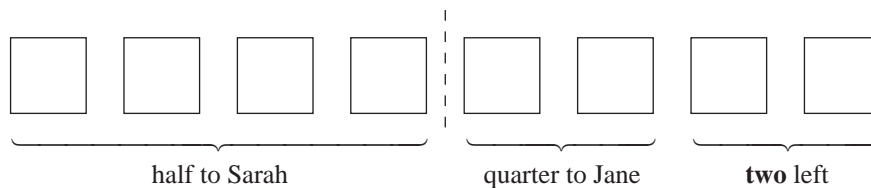
## Example

David has 8 stickers. He gives half of them to Sarah and a quarter to Jane. How many does he have left?

## Solution

You can solve this in two ways:

(a) by using a diagram:



(b) by calculations:

$$\left. \begin{array}{l} \frac{1}{2} \text{ of } 8 = 4 \\ \frac{1}{4} \text{ of } 8 = 2 \end{array} \right\} \text{ David has left } 8 - (4 + 2) = 8 - 6 = 2$$

8. John has 8 sweets. He gives  $\frac{1}{2}$  of them to Sarah and  $\frac{1}{4}$  to Mark.

- (a) How many sweets does Sarah get?
- (b) How many sweets does Mark get?
- (c) What fraction of his total does John have left?

9. Lisa has 10 tennis balls. She gives half of them to Ann.

How many does she have left?

# 2 2-D and 3-D Shapes

## 2.1 Length

1. Which of these lines is

(a) longest

(b) shortest

(c) longer than A  
but shorter than E

(d) shorter than D but  
longer than B?

A 

B 

C 

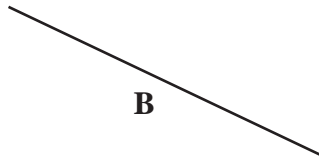
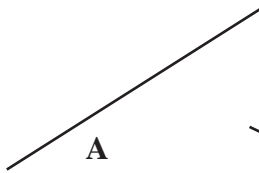
D 

E 

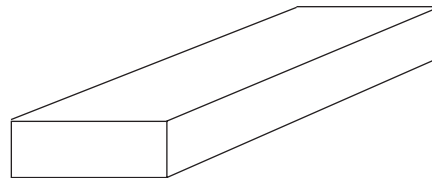
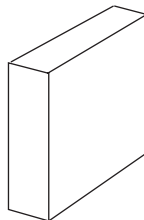
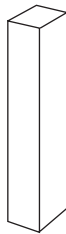
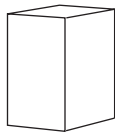
2. Which of these lines is

(a) longest

(b) shortest?



3.



A

B

C

D

(a) Which is the tallest block?

(b) Which block has the longest side length?

## 2.2 2-D Shapes

1. Name each of these shapes and give

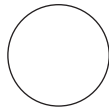
- (i) the number of *sides*                      (ii) the number of *corners (vertices)*

for each shape.

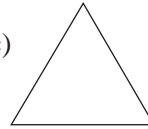
(a)



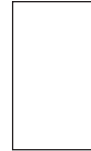
(b)



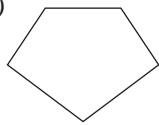
(c)



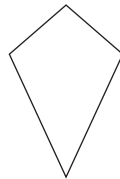
(d)



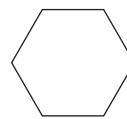
(e)



(f)



(g)



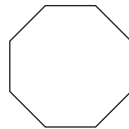
(h)



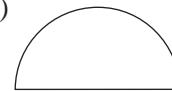
(i)



(j)



(k)



2. These shapes are made up of

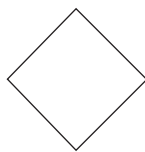
A : all straight lines

or B : all curved lines

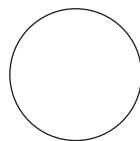
or C : some straight and some curved lines.

For each shape, state which is true, A, B or C.

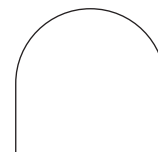
(a)



(b)



(c)



(d)



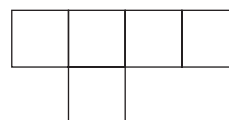
(e)



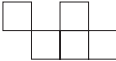
3. Draw a shape that has 7 sides and 7 corners.

4. *Pentominoes* are shapes made from 5 squares. Each square must be joined to another square along one or more edges.

Here is an example of a pentomino.



Draw as many *different* pentominoes as you can.

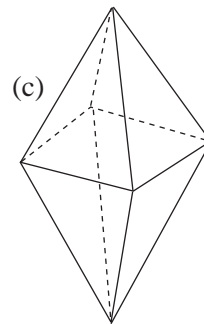
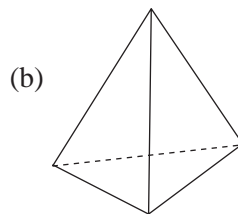
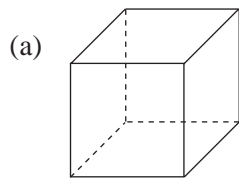
(Note that squares cannot be joined by the corners, e.g.  is not a pentomino.)

## 2.3 3-D Shapes

1. Name each of the following shapes and give

- (i) the number of *edges*
- (ii) the number of *corners (vertices)*
- (iii) the number of *faces*

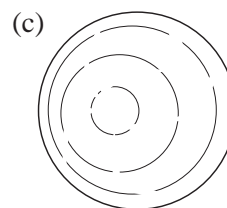
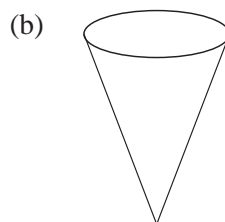
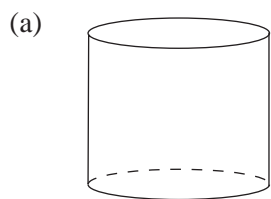
for each one.



2. For each shape in Question 1,

- (a) what is the total of the number of corners and the number of faces?
- (b) add 2 to the number of edges of each shape
- (c) what do you notice about your answers to (a) and (b) for each shape?

3. Name each of the following shapes.



4. Draw a 3-D shape that has a square base and has four triangular sides meeting at a point.

How many

- (a) *edges*
  - (b) *faces*
  - (c) *corners (vertices)*
- does your shape have?

5. Draw a 3-D shape that has 9 edges, 6 corners and 5 faces.  
What is it called?

# 3 Data Analysis 1

## 3.1 Sorting and Classifying Objects

### Example

Here are some animals

*elephant, human, mouse, chimpanzee, lion, dog, kangaroo*

Sort them into 2 groups, saying how you chose each group.

### Solution

These animals can be sorted into 2 groups in several different ways.

For example, (i) those that live naturally in the UK,

*{human, mouse, dog}*

and those that do not,

*{elephant, chimpanzee, lion, kangaroo}*.

(ii) those than can easily walk on 2 legs,

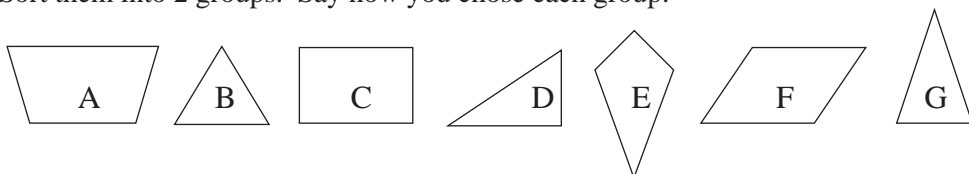
*{human, chimpanzee, kangaroo}*

and those that cannot,

*{elephant, mouse, lion, dog}*.

1. Here are some 2-D shapes.

Sort them into 2 groups. Say how you chose each group.



2. Here are some numbers,

Sort them into 2 groups. Say how you chose each group.



3. Here are some methods of transport.

*Helicopter Ship, Walk Boat Train Aeroplane Car Bus*

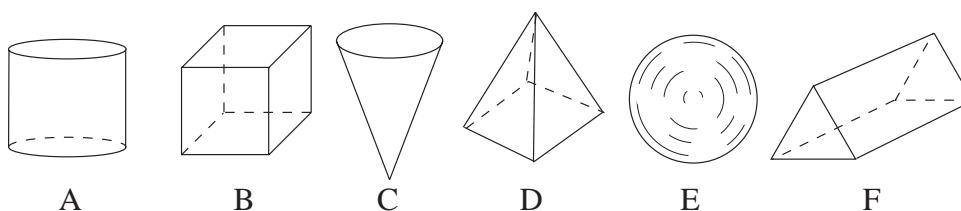
Sort them into 3 groups. Say how you chose each group.

4. Here are some sports that people take part in.

*Football Running Tennis Swimming Cricket Rugby Motor Racing*

Sort them into 2 groups. Say how you chose each group.

5. Here are some 3-D shapes.



Sort them into 2 groups. Say how you chose each group.

6. Sort these cards into 2 groups. Say how you chose each group.

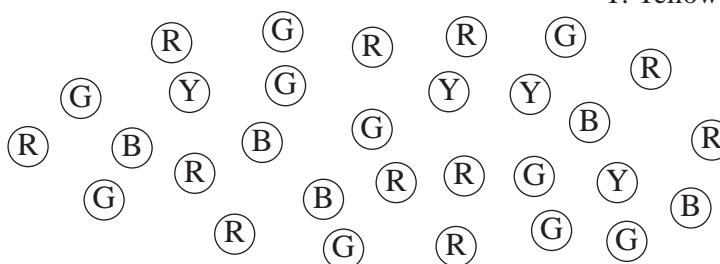


## 3.2 Extracting Data and Block Graphs

### Example

A bag contains 30 coloured discs as shown below.

(R: Red; B: Blue  
Y: Yellow; G: Green)



Complete a tally chart to find the numbers of each colour.

Illustrate the data with a block graph.

### Solution

To complete a tally chart, draw a line for each of the discs beside the correct colour,

Mark each 5th one with a line drawn across the other four.

This makes it easier to add up the totals, as you can count in fives.

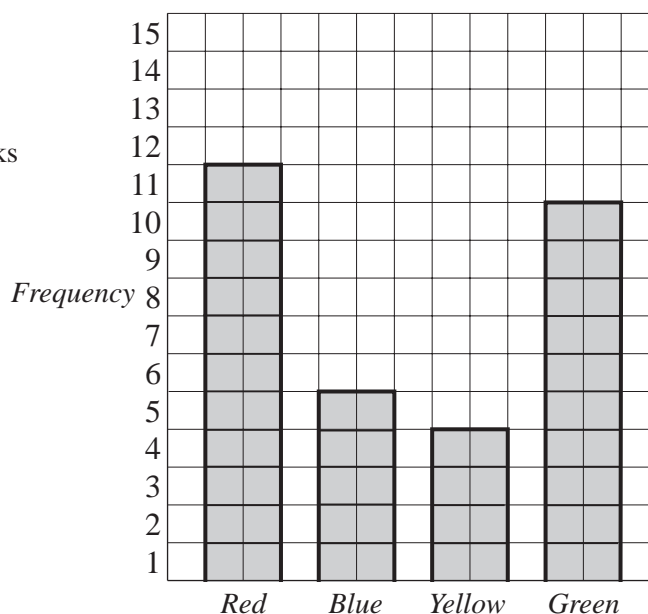
**Tally Chart**

		<i>Frequency</i>
Red	### ##	11
Blue	###	5
Yellow		4
Green	### ##	10
	Total	30

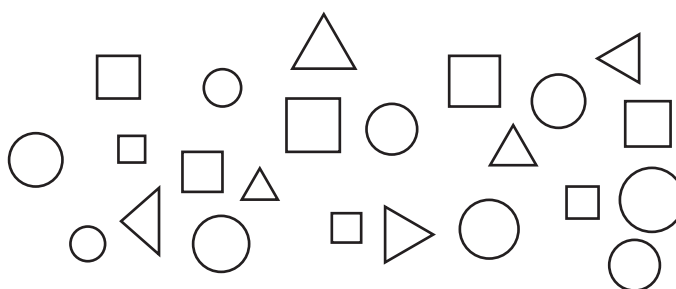
**Bar Chart**

*Frequency* means the number of times something happens.

There are 11 red discs, so 11 blocks are drawn vertically for *Red*.



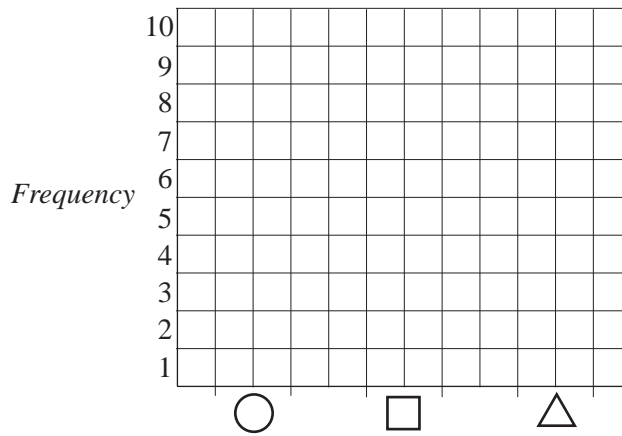
1. (a) These shapes are circles, squares and triangles. Use a tally chart like the one below to find how many circles, squares and triangles there are.



*Totals*

Circles		
Squares		
Triangles		

- (b) Show the information in a block diagram like this. (Fill in the blocks for each shape – see the previous Example and Solution.)



2. These are the goals scored one Saturday by 16 teams in the Premier Football League.

<i>Team</i>	<i>Goals scored</i>	<i>Team</i>	<i>Goals scored</i>
Aston Villa	2	Arsenal	2
Leeds	0	Manchester United	4
Liverpool	2	Southampton	1
Middlesbrough	4	Coventry	0
Nottingham Forest	0	Leicester	0
Sheffield Wednesday	0	Chelsea	2
Tottenham	1	Newcastle	2
Wimbledon	4	Everton	0

Use a tally chart to find out how many teams scored 0, 1, 2, 3 or 4 goals. Illustrate your data with a block diagram.

3. A class of 25 pupils was surveyed to find their favourite colours. The results are given in this tally chart.

	<i>Frequency</i>
Red	###
Green	
Blue	### ###
Yellow	
Black	
Total	

Find the frequency for each colour. Illustrate the data with a block diagram.

4. A group of 30 adults were surveyed to find their favourite TV 'soap'. The results are given in the tally chart below.

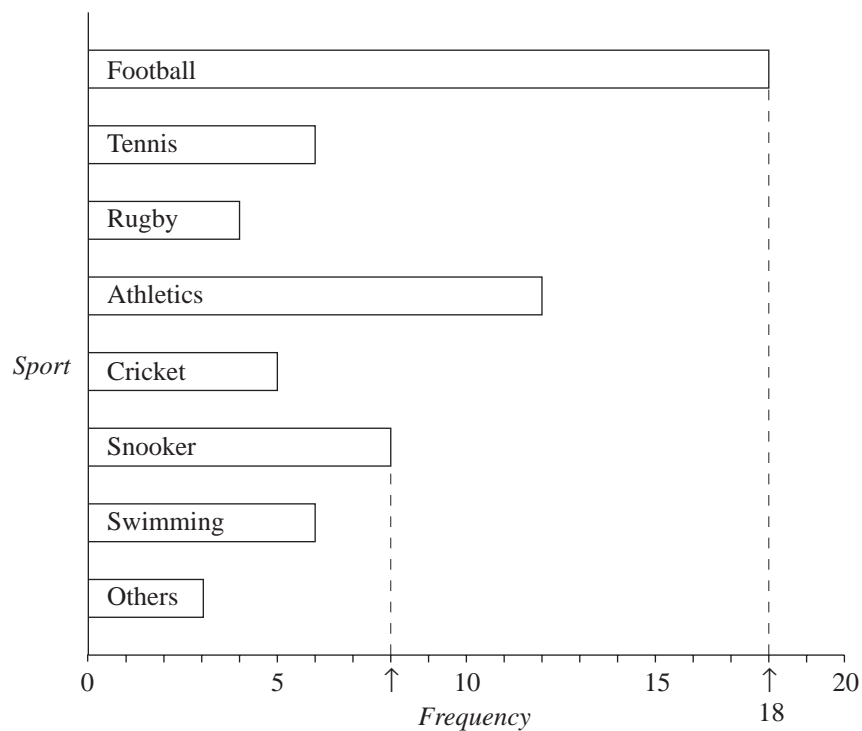
	<i>Frequency</i>	
Coronation Street	###	
Brookside	###	
Eastenders	### ###	
Emmerdale		
Neighbours		
<b>Total</b>		

Find the frequency for each programme and show the data on a block diagram.

## 3.3 Reading Data

### Example

A group of students were asked to name their favourite sport. The results are summarised below.

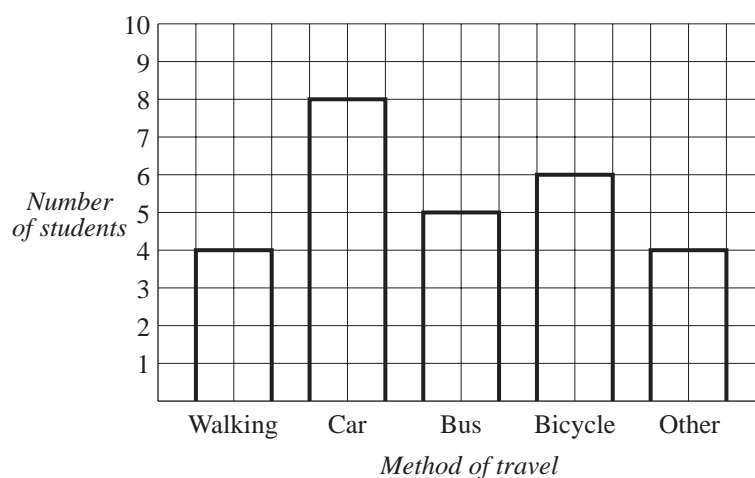


- What was the most popular sport? How many voted for this sport?
- How many voted for snooker?
- What was the second favourite sport?
- Apart from 'Others', what was the sport with fewest votes?
- Suggest what 'Others' could have included.

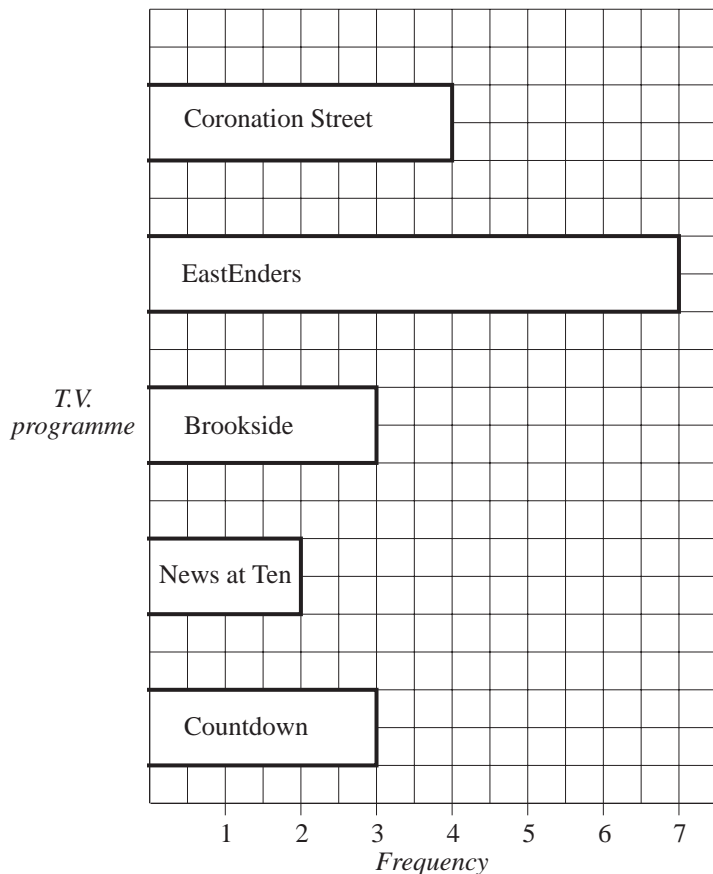
### Solution

- (a) Football – it has 18 votes (see scale along the horizontal).
- (b) 8 voted for snooker (see scale).
- (c) Athletics.
- (d) Rugby – it had 4 votes.
- (e) 'Others' could include sports such as Hockey, Netball, Motor Racing, etc.

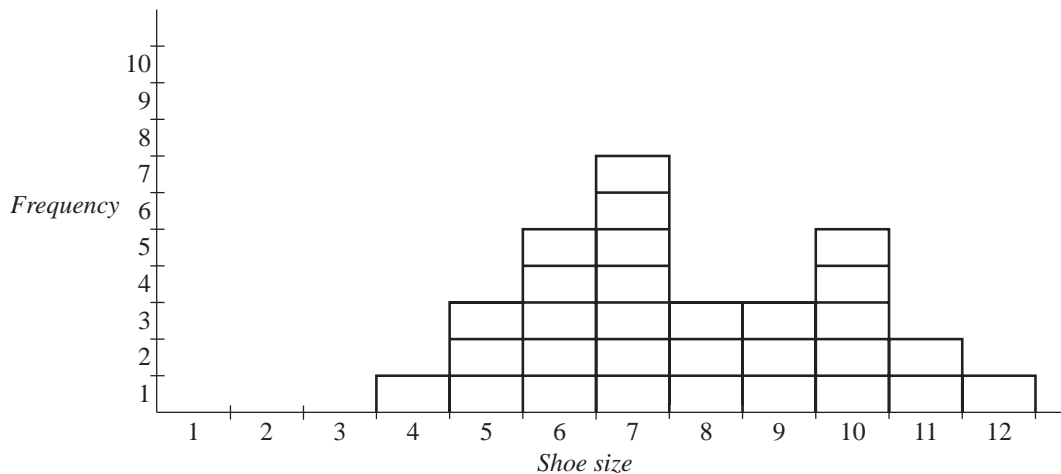
1. The results of a class survey of how students travel to school is shown below.



- (a) How many travelled by
    - (i) walking      (ii) car      (iii) bus      (iv) bicycle?
  - (b) Which was the most frequently used method of travelling to school?
  - (c) What could the 'Other' group refer to?
  - (d) How many students were surveyed?
2. A group of teachers were each asked to name their favourite TV programme. The results are summarised in the following chart.
- (a) Which was their favourite programme?
  - (b) How many teachers chose a 'soap' for their favourite?
  - (c) How many teachers were surveyed?



3. The block graph shows the shoe sizes of students in a class.



- How many in the class had shoe size
  - 7
  - 12?
- Which shoe size occurred most?
- What shoe size did only 2 students have?
- How many had shoe size 6 or smaller?
- How many had shoe size 10 or larger?

# 4 Number Patterns 1

## 4.1 Repeating Patterns

1. Write down all the ODD numbers in the list below.

10 22 7 19 32 12 8 77 81 90 48

2. Write down all the EVEN numbers in the list below.

17 34 61 52 98 73 6 16 81 49 72

3. Write down the missing numbers in each of these sequences.

(a) 2 4 6 ... 10 12 14 16

(b) 17 15 ... 11 9 ... 5 3

(c) 1 4 7 ... 13 16 ... 22

(d) 5 10 15 20 ... ... 35 40

(e) 12 22 ... 42 ... ... 72 82

(f) 1 2 4 7 ... 16 22 29

4. Write down the next three numbers for each of these sequences.

(a) 1 3 5 7 ... ..

(b) 2 6 10 14 ... ..

(c) 20 18 16 14 ... ..

(d) 3 6 9 12 ... ..

(e) 10 20 30 40 ... ..

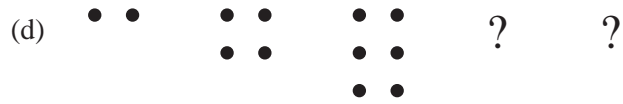
(f) 5 10 15 20 ... ..

(g) 2 4 8 16 ... ..

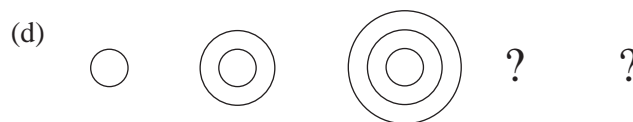
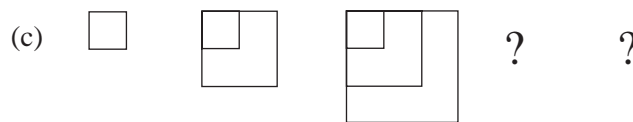
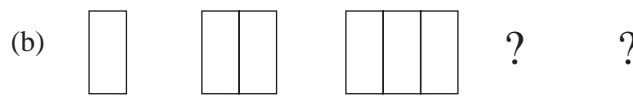
5. Continue the pattern of dots by drawing the next two terms.

(a) •    • •    • • •    ?    ?

(b) •    •  
•    •    •    ?    ?  
•    •    •



6. Continue the pattern of shapes by drawing the next two terms.



7. The Fibonacci sequence is formed by adding the two previous terms, so we have

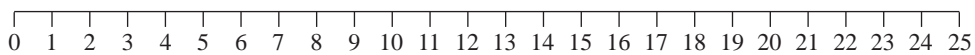
$$1, 1, 2, 3, 5, 8, \dots$$

- (a) Find the next 5 terms in this sequence.
- (b) How many terms are needed to reach at least 200?

# 5 Algebra: Equations

## 5.1 Use of Symbols

1. In each of these equations, find the value of  $\square$  so that the equation balances. You might find it helpful to use a number line for quick reference.



(a)  $4 + \square = 6$

(b)  $10 - \square = 7$

(c)  $5 + \square = 10$

(d)  $\square - 5 = 7$

(e)  $12 + \square = 18$

(f)  $15 - \square = 10$

(g)  $\square + 15 = 20$

(h)  $\square - 7 = 11$

(i)  $13 + \square = 23$

(j)  $25 - \square = 15$

(k)  $14 + \square = 20$

(l)  $17 - \square = 12$

(m)  $10 + \square = 20$

(n)  $\square - 11 = 8$

2. Choose pairs of numbers from the set

$\{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$

that satisfy the equation

$$\square + 2 = \bigcirc$$

Copy and complete the table for possible values of  $\square$  and  $\bigcirc$ .

How many pairs of answers can you find?

$\square$	$\bigcirc$
0	2
1	3
...	...
...	...

3. Repeat Question 2, with the same set of numbers and the equation

$$\square - 3 = \bigcirc$$

4. Repeat Question 2, with the same set of numbers and the equation

$$\bigcirc - \square = 5$$

# 6 Position

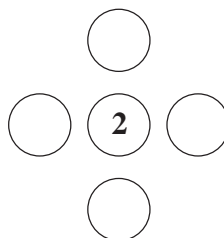
## 6.1 Describing Position

1. Look at these letters

A	B	C
D	E	F

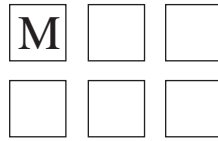
and answer the questions.

- Which letter is directly above D?
  - Which letter is directly on the left of B?
  - Which letter is directly below C?
  - Which letter is directly on the right of E?
2. Copy the diagram.



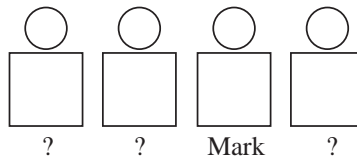
- Put the number 1 below 2.
- Put the number 6 above 2.
- Put the number 3 on the left of 2.
- If the sum of the numbers in each direction is the same, what is the missing number?

3. Copy the diagram.



- Put the letter G beneath the letter M.
  - Put the letter R in the top right hand square.
  - Put the letter A directly on the right of M.
  - Put another letter A underneath the first one.
  - Where is the square that does not have a letter in it?
4. Four boys sit in a row as shown.

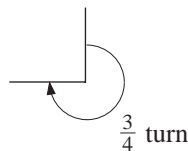
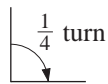
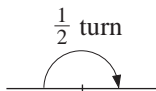
Copy the diagram and use the information below to fill in the names.



- Tom sits on the far right.
- Robert sits next to Mark.
- John sits next to Robert.

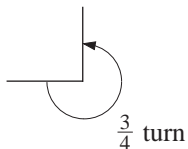
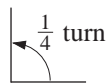
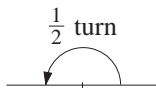
## 6.2 Turns

For this section, it is important that you understand these angle measurements.



These are all  
CLOCKWISE turns

and, similarly,

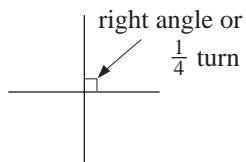


These are all  
ANTICLOCKWISE turns

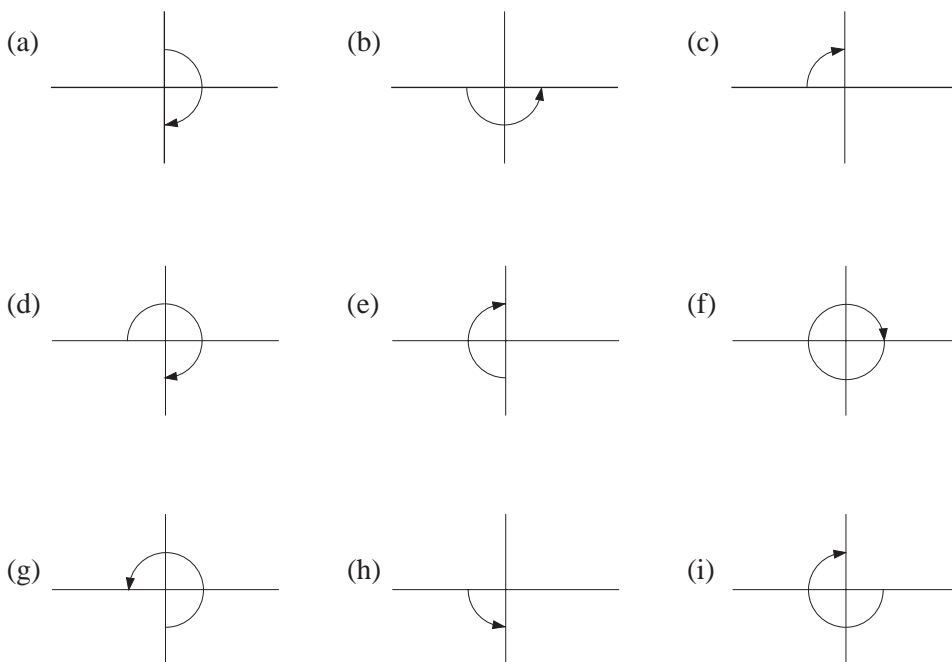
Also note that we write

$$\frac{1}{4} \text{ turn} = \text{RIGHT ANGLE}$$

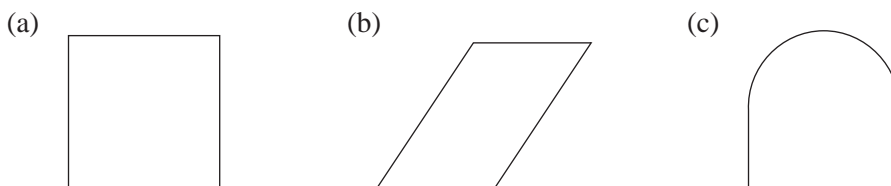
and it is shown with a square block, as in this diagram.

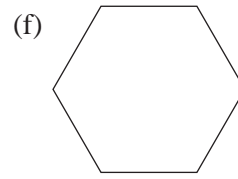
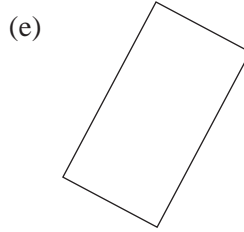
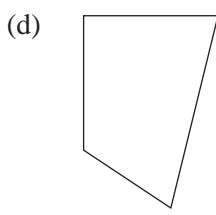


1. Say whether the marked angle is a  $\frac{1}{4}$  turn,  $\frac{1}{2}$  turn,  $\frac{3}{4}$  turn or a full turn.  
Say if each one is clockwise or anticlockwise.

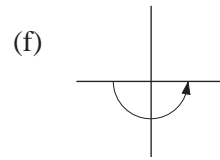
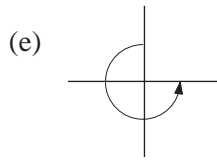
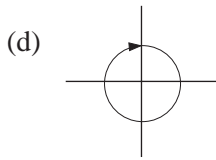
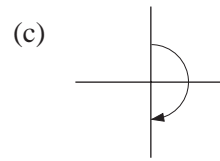
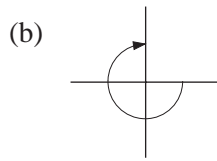
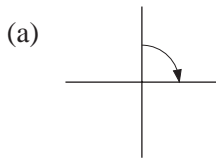


2. Copy these shapes and mark all right angles with a  $\times$ .





3. Write down how many right-angled turns are made in the turns shown.



# 7 Measurement

## 7.1 Length

mm: millimetres    cm: centimetres    m: metre(s)    km: kilometre(s)

$$1 \text{ km} = 1000 \text{ m}$$

$$1 \text{ m} = 100 \text{ cm} \text{ or } 1000 \text{ mm}$$

$$1 \text{ cm} = 10 \text{ mm}$$

1. Which of these units

mm    cm    m    km

would you use to measure

- |                                     |                                   |
|-------------------------------------|-----------------------------------|
| (a) your height                     | (b) the sides of a football field |
| (c) the distance between two cities | (d) the diameter of a screw       |
| (e) the height of a block of flats  | (f) the length of a shoe lace?    |

2. Convert

- (a) 200 cm to metres  
 (b) 4000 m to kilometres  
 (c) 50 mm to centimetres  
 (d) 7000 mm to metres

3. Convert

- (a) 3 m to centimetres  
 (b) 2 km to metres  
 (c) 6 cm to millimetres  
 (d) 4 m to millimetres

## 7.2 Mass

kg: kilogram(s)      g: gram(s)

1 kg = 1000 g
---------------

1. Which of these units

kg      g

would you use to weigh

- (a) a bag of potatoes  
 (b) a small apple  
 (c) your weight  
 (d) a packet of crisps?

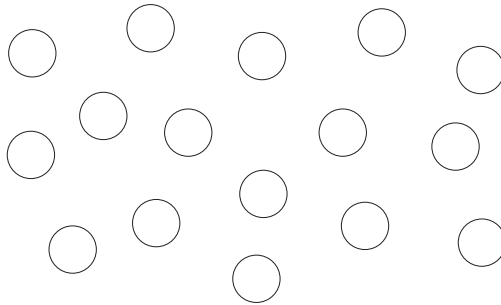
2. Convert

- (a) 4000 g to kilograms  
 (b) 500 g to kilograms  
 (c) 3 kg to grams  
 (d)  $2\frac{1}{2}$  kg to grams.



# Miscellaneous Exercises

1.



- (a) How many circles are there?
- (b) How many circles are a *quarter*  $\left(\frac{1}{4}\right)$  of the total number?

2. Write down another two addition sums which give the answer 15.

$$10 + 5 = 15$$

$$\square + \square = 15$$

$$\square + \square = 15$$

3. (a) Find two *odd* numbers that give a difference of 10, so that

$$\square - \square = 10$$

(b) Find two *even* numbers that give a difference of 12, so that

$$\square - \square = 12$$

4. Mrs Smith is taking her three children to the cinema.

It costs £5 for an adult ticket and £2 for a child.

Copy the lines below and fill in the gaps to find how much the tickets cost in total.

$$\text{Cost of 1 adult ticket} = \text{£} \dots\dots\dots$$

$$\text{Cost of 3 child tickets} = \text{£} \dots\dots\dots$$

$$\text{Total cost} = \text{£} \dots\dots\dots$$

5. Write down the missing number in each case.

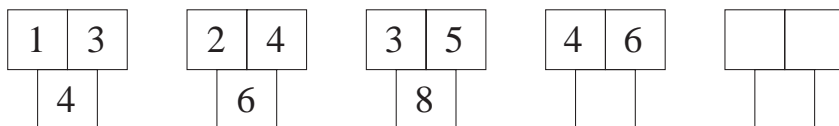
(a)  $8 - \square = 5$

(b)  $4 \times \square = 20$

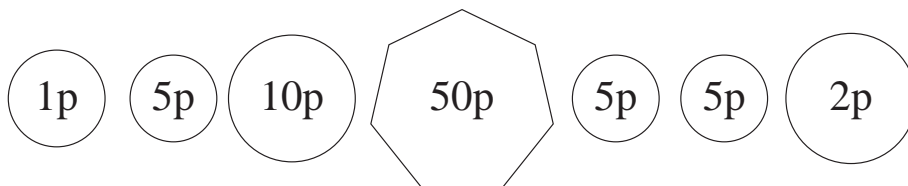
(c)  $\square \div 5 = 3$

(d)  $12 \div \square = 3$

6. Use number patterns to find the missing numbers.



7. (a) John has these coins in his pocket.



Which coins would he use to pay exactly 27p for a bar of chocolate?

(b) Sarah buys a packet of crisps for 33p.

How much change will she get from a 50p coin?

8. Write down 479 in words.

9. (a) A pair of trainers usually costs £26.

In a sale they are sold at HALF ( $\frac{1}{2}$ ) price.

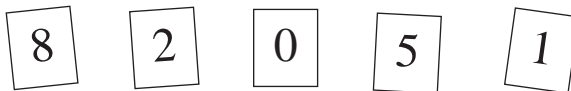
How much do the trainers cost in the sale?

(b) A book is sold at HALF ( $\frac{1}{2}$ ) price in a sale.

It costs £3 in the sale.

What was the price of the book before the sale?

10. These are number cards.



You can show the number 

2	1	5
---	---	---

 with 3 of the cards.

Write down

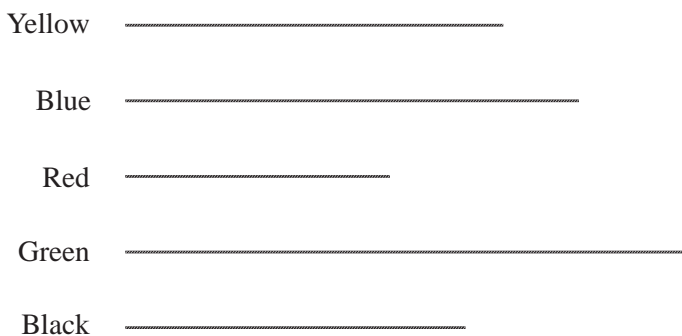
- (a) the **BIGGEST** number you can show with any 3 of the cards 

--	--	--
  
- (b) the **SMALLEST** number you can show with any 2 more cards 

5		
---	--	--
  
- (c) the number which is **TEN** times **BIGGER** than eighty two. 

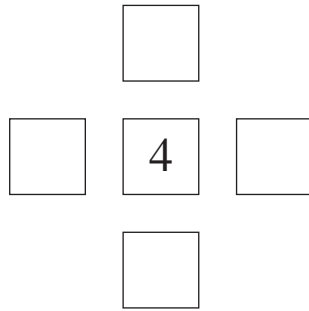
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11. Here are some lengths of coloured cotton.



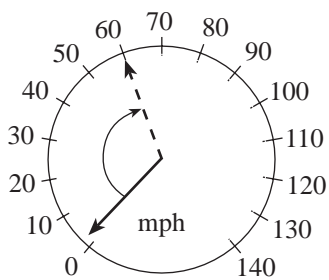
- (a) Write down the colour of the cotton which is *longest*.
- (b) Write down the colour of the cotton which is *shortest*.
- (c) Write down the colour of the cotton which is *longer* than the yellow but *shorter* than the green.
- (d) Write down the colours of the cottons which are *shorter* than the yellow.

12. Copy the diagram.



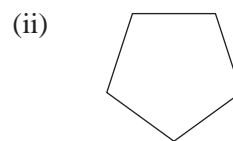
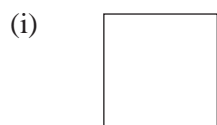
- (a) Put the number 5 in the box *under* the 4.
- (b) Put the number 2 in the box *to the right* of the 4.
- (c) Put the number 6 in the box *above* the 4.

13.

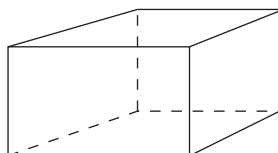


- (a) As a car accelerates from rest to 60 mph, its speedometer moves as shown in the diagram.  
Does the indicator move *clockwise* or *anticlockwise*?
- (b) The car brakes to slow down.  
Does the indicator move *clockwise* or *anticlockwise*?

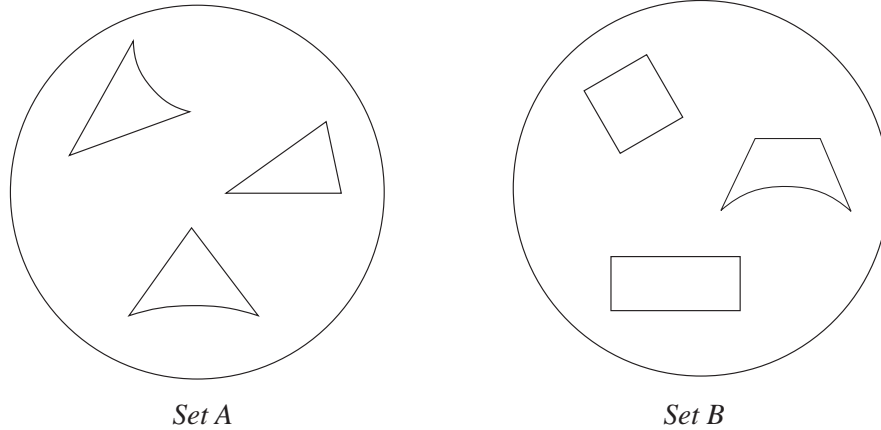
14. (a) Write down the names of these shapes.



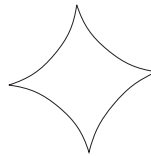
(b) Name the shape of this container.



15.



In which set would you put this shape?



Why?

16. Ellen asked the pupils in her class to name their favourite colour:

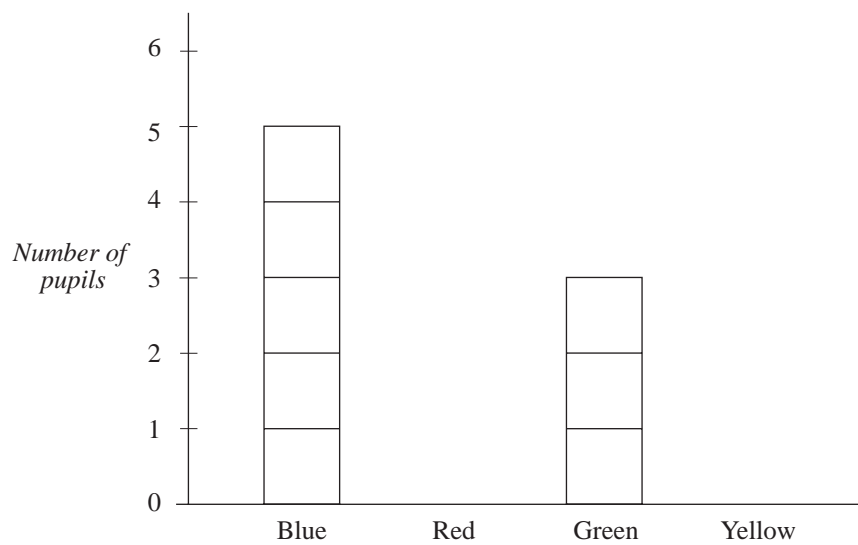
five said BLUE

six said RED

three said GREEN

one said YELLOW

(a) Copy and complete the following block graph to show the results.

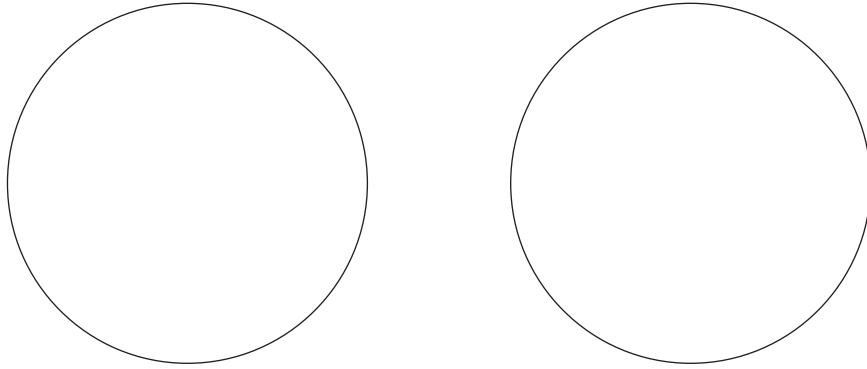


(b) Write a title for the block graph.

(c) How many pupils are in Ellen's class?

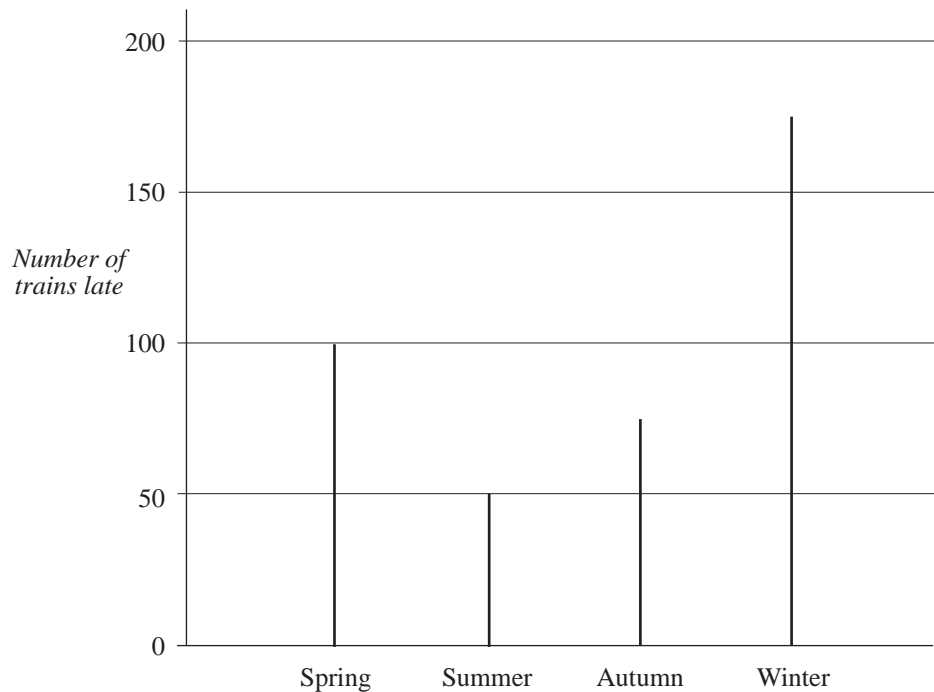
17.      *Football*      *Netball*      *Running*      *Swimming*  
             *Rugby*      *Long jump*      *Cricket*      *Hockey*

Draw two circles like these. Sort the sports into two groups and write them in your circles.



How did you choose your groups?

18. The graph shows the number of trains that were late on Great Western Railways in Spring, Summer, Autumn and Winter last year.



- (a) How many trains were late in Spring?  
 (b) How many trains were late in Autumn?  
 (c) In which season were 175 trains late?

# 8 Number Concepts 2

## 8.1 Place Value

1. Write as a number

- (a) twenty three
- (b) one hundred and sixty seven
- (c) two thousand three hundred and forty five
- (d) seventy nine
- (e) five hundred and thirteen
- (f) eight thousand nine hundred and thirty four
- (g) five hundred and six
- (h) nine thousand and eleven
- (i) twenty five thousand six hundred and thirty one
- (j) eighteen thousand and sixty four
- (k) one hundred and twenty two thousand six hundred and nineteen
- (l) three million

2. Write in words

- |             |             |            |               |
|-------------|-------------|------------|---------------|
| (a) 39      | (b) 286     | (c) 5362   | (d) 47        |
| (e) 616     | (f) 7282    | (g) 708    | (h) 6021      |
| (i) 3007    | (j) 20 306  | (k) 50 208 | (l) 2 000 000 |
| (m) 360 000 | (n) 523 176 |            |               |

3. For a group of digits, write down the *smallest* number and then the *largest* number that can be written.

### Example

Using the digits 3 2 1 6 7 write down the *smallest* number and then the *largest* number that can be written.

### Solution

The *smallest* number that can be written is

12 367      The digits are in *ascending* order (smallest first, and then increasing).

The *largest* number that can be written is

76 321      The digits are in *descending* order (largest first and then decreasing).

For each group of digits given here, write down the *smallest* number and then the *largest* number that can be written.

- |                   |                 |
|-------------------|-----------------|
| (a) 8 1 3         | (b) 2 8 7       |
| (c) 5 6 1 4       | (d) 9 1 1 5     |
| (e) 1 2 3 8 4     | (f) 7 2 9 1 8   |
| (g) 3 1 4 8 9 6   | (h) 8 2 2 6 7 1 |
| (i) 7 7 6 9 8 5 4 | (j) 1 2 3 2 7 4 |

4. Write each set of numbers in *ascending* order (that is starting with the *smallest* first).

- (a) 35, 27, 98, 16, 42  
 (b) 108, 320, 96, 906, 78  
 (c) 5001, 5232, 565, 5020, 50 023  
 (d) 76 231, 70 201, 76 097, 76 621, 700 370  
 (e) 1001, 10 001, 101, 606, 66

5. What is the value of the 5 in the following numbers?

### Example

- (i) In the number 451 the value of the 5 is 5 tens or 50.  
 (ii) In the number 25 863 the value of the 5 is 5 thousands or 5000.

- |             |             |               |               |
|-------------|-------------|---------------|---------------|
| (a) 51      | (b) 125     | (c) 5062      | (d) 65 211    |
| (e) 20 725  | (f) 503 262 | (g) 350 219   | (h) 1562      |
| (i) 321 567 | (j) 256 414 | (k) 2 364 125 | (l) 5 236 874 |

6. Jane has to pay some bills. Put them in order with the largest amount first.

£206   £370   £125   £66   £900   £563   £307   £26

7. Ten single digits are written onto discs.

The digits are: 1 5 7 8 9 2 1 7 3 2

- (a) Which five digits would you pick to get the *largest* number?

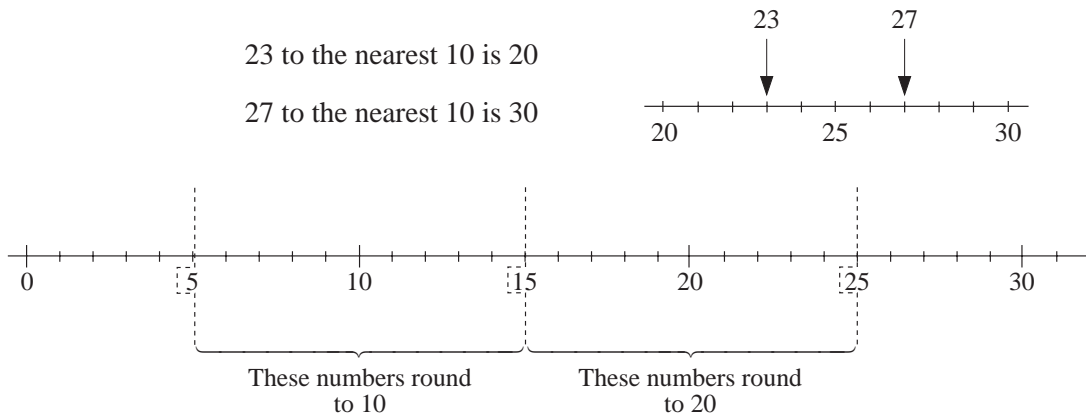
Write down the number.

- (b) Which five digits would you pick to get the *smallest* number?

Write down the number.

## 8.2 Rounding Numbers

We will first look at rounding to the nearest 10.



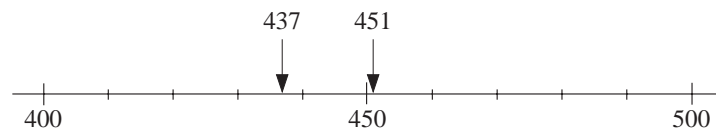
Note that we round 15 up to 20, 25 up to 30, etc.

When rounding to the nearest 100

437 to the nearest 100 is 400

but

451 to the nearest 100 is 500



Similarly

450 to the nearest 100 is 500

449 to the nearest 100 is 400

1. Round these numbers to the nearest 10.

- |            |            |            |             |
|------------|------------|------------|-------------|
| (a) 23     | (b) 38     | (c) 12     | (d) 93      |
| (e) 77     | (f) 65     | (g) 45     | (h) 116     |
| (i) 382    | (j) 1274   | (k) 4785   | (l) 2436    |
| (m) 72 163 | (n) 31 224 | (o) 55 555 | (p) 100 208 |

2. Round these numbers to the nearest 100.

- |            |            |             |             |
|------------|------------|-------------|-------------|
| (a) 723    | (b) 361    | (c) 584     | (d) 835     |
| (e) 87     | (f) 1239   | (g) 3874    | (h) 3854    |
| (i) 20 362 | (j) 71 036 | (k) 100 208 | (l) 333 333 |

3. These are the numbers of people at football matches one Saturday.

Round each of them to the nearest 1000.

- |            |            |            |
|------------|------------|------------|
| (a) 12 360 | (b) 8642   | (c) 36 581 |
| (d) 18 890 | (e) 7362   | (f) 9742   |
| (g) 682    | (h) 52 999 | (i) 17 500 |

4. Round each number to the nearest 10 and then do the calculation.

- |               |               |               |
|---------------|---------------|---------------|
| (a) $32 + 54$ | (b) $67 + 41$ | (c) $27 + 35$ |
| (d) $48 + 81$ | (e) $12 + 87$ | (f) $69 + 39$ |

Next, calculate each sum *exactly* and then round each of the answers to the nearest 10.

What do you notice?

## 8.3 Whole Number: Addition

Add the following sets of numbers.

- |                  |               |               |
|------------------|---------------|---------------|
| 1. (a) $42 + 5$  | (b) $71 + 8$  | (c) $84 + 5$  |
| (d) $91 + 8$     | (e) $27 + 4$  | (f) $7 + 67$  |
| 2. (a) $58 + 13$ | (b) $43 + 12$ | (c) $74 + 28$ |
| (d) $64 + 27$    | (e) $72 + 38$ | (f) $25 + 57$ |

3. (a)  $246 + 5$  (b)  $471 + 6$  (c)  $128 + 9$   
(d)  $255 + 5$  (e)  $584 + 7$  (f)  $4 + 117$
4. (a)  $716 + 25$  (b)  $841 + 19$  (c)  $952 + 38$   
(d)  $147 + 30$  (e)  $743 + 58$  (f)  $95 + 116$
5. (a)  $942 + 35$  (b)  $278 + 51$  (c)  $451 + 78$   
(d)  $784 + 77$  (e)  $841 + 94$  (f)  $66 + 534$
6. (a)  $422 + 371$  (b)  $570 + 210$  (c)  $351 + 163$   
(d)  $848 + 214$  (e)  $777 + 210$  (f)  $424 + 646$
7. (a)  $512 + 634$  (b)  $485 + 694$  (c)  $241 + 894$   
(d)  $735 + 300$  (e)  $947 + 238$  (f)  $432 + 848$
8. For these questions, write out a sum and add.
- (a) I have 17 apples and 12 oranges. How much fruit do I have?
- (b) Tim delivers 42 papers on Tuesday and 74 on Wednesday,  
How many does he deliver altogether?
- (c) A coach can hold 52 people. How many people can 2 coaches hold?
- (d) The final score in a rugby match was 23 points to 51 points.  
How many points were scored in total?
- (e) What is the total of 124 and 368?
- (f) In my street there are 124 houses on the left and 128 on the right.  
How many houses are there altogether?
- (g) I travel 219 miles from Edinburgh to Manchester and 204 miles from  
Manchester to London.  
How many miles have I travelled from Edinburgh to London?

- (h) A cricket team scores 544 runs in the 1st innings and 278 in the 2nd innings. How many runs have they scored altogether?
- (i) 328 people go to a cinema on Thursday. If 542 people go on Friday, how many people in total went on the two days?
- (j) I have £148 in my bank account. If I get paid £784, what is my new bank balance?
- (k) A factory produces 428 vans and 843 cars each week. How many vehicles are produced each week?
- (l) A ferry holds 731 foot passengers and 572 car passengers. What is its total capacity?

9. Work out

- (a)  $74 + 21 + 14$       (b)  $52 + 13 + 41$       (c)  $78 + 25 + 61$   
(d)  $17 + 18 + 19$       (e)  $94 + 50 + 71$       (f)  $26 + 27 + 62$

10. Work out

- (a)  $124 + 93 + 12$       (b)  $256 + 321 + 518$       (c)  $72 + 940 + 31$   
(d)  $85 + 850 + 7$       (e)  $421 + 378 + 94$       (f)  $756 + 340 + 814$   
(g)  $812 + 942 + 371$       (h)  $57 + 100 + 94$       (i)  $131 + 401 + 342$   
(j)  $666 + 94 + 38$       (k)  $171 + 343 + 730$       (l)  $50 + 900 + 427$   
(m)  $258 + 799 + 400$       (n)  $366 + 938 + 542$       (o)  $875 + 123 + 444$

## 8.4 Whole Number: Subtraction

1. Work out

- (a)  $43 - 12$       (b)  $56 - 23$       (c)  $35 - 21$   
(d)  $24 - 14$       (e)  $18 - 14$       (f)  $56 - 45$

2. (a)  $64 - 8$       (b)  $54 - 7$       (c)  $41 - 5$   
(d)  $96 - 7$       (e)  $63 - 6$       (f)  $38 - 9$

3. (a)  $81 - 44$  (b)  $98 - 39$  (c)  $42 - 33$   
(d)  $95 - 49$  (e)  $73 - 29$  (f)  $55 - 27$
4. (a)  $856 - 821$  (b)  $731 - 711$  (c)  $266 - 141$   
(d)  $353 - 130$  (e)  $938 - 233$  (f)  $443 - 321$
5. (a)  $980 - 37$  (b)  $960 - 543$  (c)  $450 - 39$   
(d)  $991 - 82$  (e)  $864 - 516$  (f)  $741 - 636$
6. (a)  $652 - 328$  (b)  $144 - 71$  (c)  $374 - 165$   
(d)  $577 - 148$  (e)  $784 - 549$  (f)  $572 - 391$
7. (a)  $159 - 99$  (b)  $400 - 236$  (c)  $146 - 98$   
(d)  $387 - 138$  (e)  $700 - 321$  (f)  $612 - 345$

8. Write out a subtraction sum for these and find the answers.

- (a) I start with 72 sweets. I eat 29.  
How many do I have left?
- (b) In the morning a shop has 144 cans of coke. At the end of the day there are 78.  
How many did they sell?
- (c) A bus has 58 passengers. If 27 get off, how many passengers are now on the bus?
- (d) A basketball match score was  $121 - 94$ . What was the difference in the scores?
- (e) Jon has to deliver 948 leaflets. He delivers 278 on Monday.  
How many does he have left?
- (f) Tom has 258 CDs. Liz has 371 CDs.  
How many more does Liz have than Tom?
- (g) Kate has £270. She buys a dress costing £97.  
Can she afford a coat which costs £180?

- (h) A cricket team scores 328 runs. Their opponents score 172 runs.  
What is the winning margin?
- (i) 921 people are on a train. If 738 get off in London, how many are left?
- (j) I have £373 in my bank account. I pay a gas bill and then have £159 left.  
How much was the gas bill?
- (k) A garage aims to sell 700 cars a week. If they sell 384 by Wednesday, how  
many more must they sell to reach the target that week?
- (l) A school has 483 boys in it. If there are 734 pupils altogether, how many  
girls are there?

9. Work out:

- |                 |                 |                 |
|-----------------|-----------------|-----------------|
| (a) $73 - 41$   | (b) $91 - 30$   | (c) $120 - 50$  |
| (d) $278 - 135$ | (e) $747 - 318$ | (f) $976 - 639$ |
| (g) $804 - 273$ | (h) $700 - 246$ | (i) $97 - 59$   |
| (j) $664 - 581$ | (k) $731 - 699$ | (l) $873 - 617$ |
| (m) $500 - 212$ | (n) $726 - 149$ | (o) $893 - 28$  |
| (p) $153 - 12$  | (q) $806 - 294$ | (r) $348 - 179$ |
| (s) $999 - 349$ | (t) $678 - 294$ | (u) $700 - 586$ |
| (v) $900 - 71$  | (w) $737 - 549$ | (x) $257 - 198$ |

## 8.5 Whole Number: Multiplication

Work these out.

- |    |                   |                   |                   |
|----|-------------------|-------------------|-------------------|
| 1. | (a) $13 \times 3$ | (b) $12 \times 4$ | (c) $14 \times 2$ |
|    | (d) $13 \times 2$ | (e) $21 \times 5$ | (f) $23 \times 3$ |
| 2. | (a) $16 \times 4$ | (b) $17 \times 5$ | (c) $24 \times 6$ |
|    | (d) $38 \times 3$ | (e) $41 \times 4$ | (f) $46 \times 5$ |
| 3. | (a) $46 \times 8$ | (b) $51 \times 7$ | (c) $21 \times 9$ |
|    | (d) $14 \times 7$ | (e) $9 \times 48$ | (f) $5 \times 33$ |

4. (a)  $60 \times 4$  (b)  $70 \times 8$  (c)  $30 \times 5$   
(d)  $20 \times 6$  (e)  $50 \times 9$  (f)  $40 \times 7$
5. (a)  $76 \times 6$  (b)  $49 \times 7$  (c)  $58 \times 5$   
(d)  $94 \times 3$  (e)  $112 \times 4$  (f)  $212 \times 2$
6. (a)  $71 \times 7$  (b)  $38 \times 9$  (c)  $54 \times 8$   
(d)  $64 \times 7$  (e)  $31 \times 9$  (f)  $44 \times 8$
7. (a)  $92 \times 7$  (b)  $86 \times 8$  (c)  $84 \times 9$   
(d)  $77 \times 7$  (e)  $98 \times 9$  (f)  $75 \times 7$

8. Write out a multiplication sum and then work out the answer for each of these .

- (a) A box holds 72 oranges.  
How many oranges will 6 boxes hold?
- (b) A bus can carry 52 passengers.  
How many passengers can 8 buses carry?
- (c) A car travels 36 miles on one gallon of petrol.  
How far does it travel on 8 gallons?
- (d) Books cost £17 each. How much do 9 books cost?
- (e) I buy 36 apples at 9p each.  
How much do I pay?
- (f) I have 8 rows of plants in my garden. If there are 43 in each row, how many plants are there altogether?
- (g) A milk crate holds 18 bottles.  
How many bottles in 5 crates?
- (h) A basketball shot gives 3 points.  
How many points will you score from 93 shots?
- (i) How many runs will 23 fours total in cricket?
- (j) An American football team scores 73 touchdowns in a year.  
Each touchdown is worth 6 points.  
What was their total score?

- (k) A ferry travels 33 miles on one journey.  
How far will it travel in 7 journeys?
- (l) A lorry can carry 22 tons of goods.  
What weight can 6 lorries carry?
- (m) A car driver is paid 9p for every mile she drives.  
How much will she be paid for 428 miles?

9. Work out:

- |                   |                   |                   |
|-------------------|-------------------|-------------------|
| (a) $14 \times 3$ | (b) $12 \times 7$ | (c) $19 \times 4$ |
| (d) $34 \times 5$ | (e) $9 \times 21$ | (f) $7 \times 52$ |
| (g) $7 \times 52$ | (h) $56 \times 7$ | (i) $64 \times 9$ |
| (j) $93 \times 5$ | (k) $7 \times 36$ | (l) $28 \times 4$ |
| (m) $36 \times 3$ | (n) $9 \times 27$ | (o) $8 \times 41$ |
| (p) $3 \times 21$ | (q) $14 \times 7$ | (r) $31 \times 9$ |
| (s) $48 \times 6$ | (t) $50 \times 5$ | (u) $7 \times 25$ |
| (v) $6 \times 53$ | (w) $36 \times 5$ | (x) $8 \times 59$ |

## 8.6 Whole Number: Division

- |    |                  |                 |                 |
|----|------------------|-----------------|-----------------|
| 1. | (a) $10 \div 2$  | (b) $10 \div 2$ | (c) $20 \div 5$ |
|    | (d) $20 \div 2$  | (e) $16 \div 4$ | (f) $20 \div 4$ |
| 2. | (a) $12 \div 2$  | (b) $24 \div 4$ | (c) $12 \div 3$ |
|    | (d) $14 \div 2$  | (e) $25 \div 5$ | (f) $30 \div 6$ |
| 3. | (a) $24 \div 4$  | (b) $50 \div 5$ | (c) $21 \div 3$ |
|    | (d) $18 \div 2$  | (e) $35 \div 5$ | (f) $15 \div 5$ |
| 4. | (a) $24 \div 6$  | (b) $32 \div 4$ | (c) $28 \div 7$ |
|    | (d) $40 \div 4$  | (e) $36 \div 6$ | (f) $35 \div 7$ |
| 5. | (a) $21 \div 7$  | (b) $32 \div 8$ | (c) $64 \div 8$ |
|    | (d) $40 \div 5$  | (e) $27 \div 9$ | (f) $42 \div 6$ |
| 6. | (a) $70 \div 10$ | (b) $40 \div 2$ | (c) $18 \div 2$ |
|    | (d) $49 \div 7$  | (e) $36 \div 9$ | (f) $54 \div 3$ |

7. (a)  $100 \div 10$  (b)  $40 \div 2$  (c)  $33 \div 3$   
(d)  $81 \div 9$  (e)  $88 \div 4$  (f)  $96 \div 3$
8. Write a division sum and work out the answer for each of these.
- (a) I divide £21 equally between 3 boys.  
How much do they get each?
- (b) What is the smallest number of cars needed to carry 44 children if each car carries 4?
- (c) A class of 24 pupils is divided into teams of equal numbers.  
How many pupils will be in each team if there are  
(i) 4 teams (ii) 8 teams (iii) 6 teams?
- (d) There are 40 sweets in a box. Five people share them equally.  
How many sweets do they get each?
- (e) A 5-a-side team wins £45. The players share this equally.  
How much does each player get?
- (f) 68 felt-tip pens are shared equally among 9 children.  
(i) How many pens does each child get?  
(ii) How many pens are left over?
- (g) A group of 8 people win £56 on the lottery. They share this out equally between them.  
How much do they get each?
- (h) How many piles of 8 books can be made from 32 books?
- (i) (i) How many groups of 6 can you get from 92 people?  
(ii) Are there any people left over?
- (j) Wine bottles are put in boxes of 6.  
How many boxes do you need for 84 bottles?
- (k) There are 7 classes of equal size in Year 7. If there are 210 pupils in total, how many are in each class?
9. (a)  $27 \div 3$  (b)  $34 \div 2$  (c)  $60 \div 4$   
(d)  $84 \div 3$  (e)  $70 \div 5$  (f)  $96 \div 4$   
(g)  $85 \div 5$  (h)  $76 \div 4$  (i)  $85 \div 5$   
(j)  $99 \div 9$  (k)  $63 \div 7$  (l)  $72 \div 4$

(m)  $72 \div 6$

(n)  $93 \div 3$

(o)  $80 \div 5$

(p)  $42 \div 7$

(q)  $84 \div 6$

(r)  $90 \div 2$

(s)  $78 \div 3$

(t)  $45 \div 5$

(u)  $56 \div 8$

# 9 Symmetry and Congruence

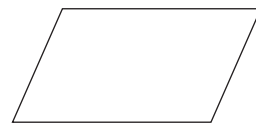
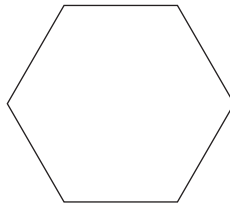
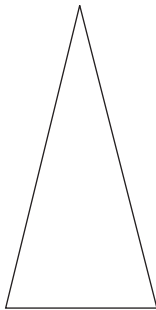
## 9.1 Symmetry

A shape has *line symmetry* if it can be folded on a line so that one half of the shape fits exactly on the other half. The line of symmetry is sometimes called the mirror line, as one half of the shape looks like a reflection of the other half.

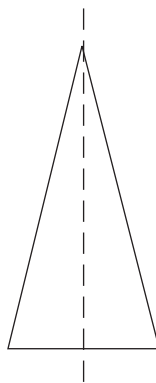
A shape can have several lines of symmetry.

### Example

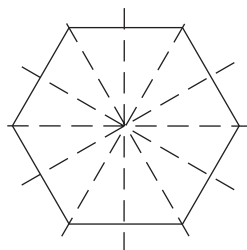
Show all the lines of symmetry on the shapes below.



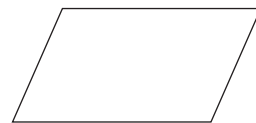
### Solution



*1 line of symmetry*



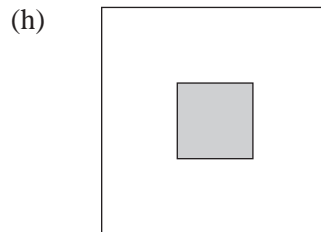
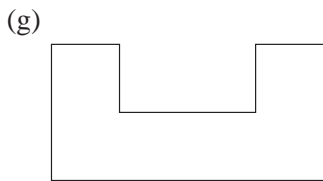
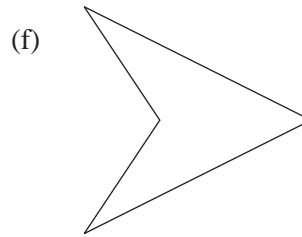
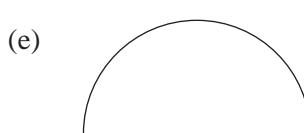
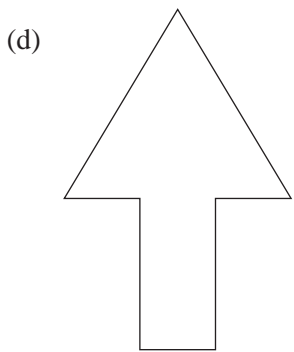
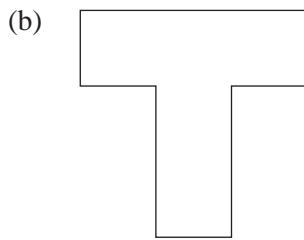
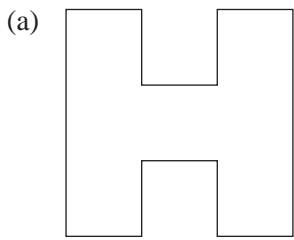
*6 lines of symmetry*



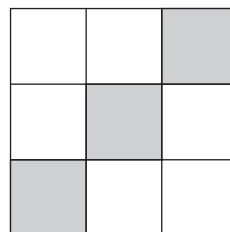
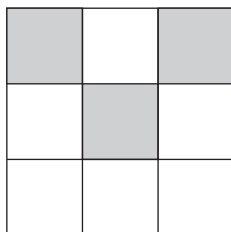
*0 lines of symmetry*

Note that, for a line of symmetry, the shapes must be like a mirror reflection each side of the line.

1. Copy each of these shapes and mark any lines of symmetry.



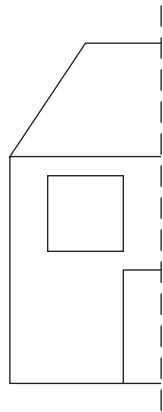
2. Look carefully at these patterns. Each pattern is in the form of a  $3 \times 3$  square. Each square has 3 of the smaller squares shaded in.



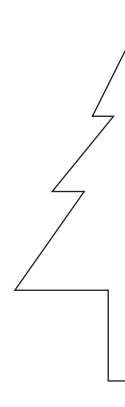
- (a) Copy the two patterns and mark any lines of symmetry you can find on each pattern.
- (b) Draw *six* more different patterns made from  $3 \times 3$  squares with 3 smaller squares shaded in, Mark any lines of symmetry you can find.

3. Reflect these designs in the mirror lines to show 2-D symmetrical shapes.

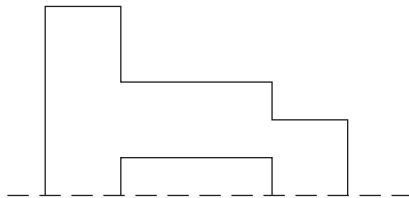
(a)



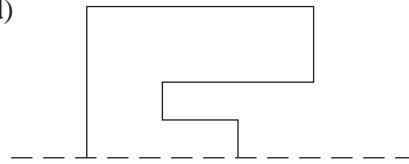
(b)



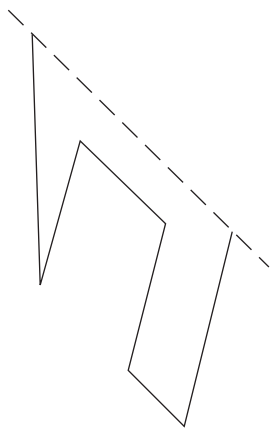
(c)



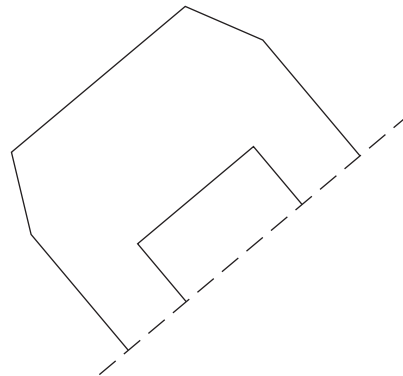
(d)



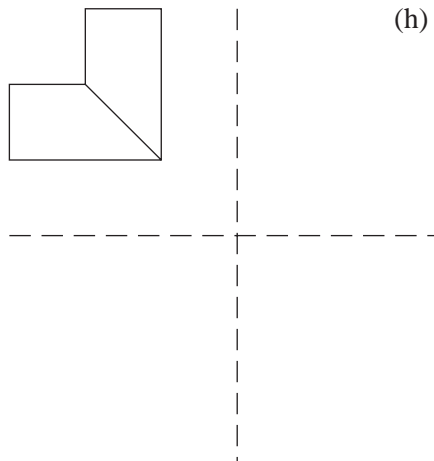
(e)



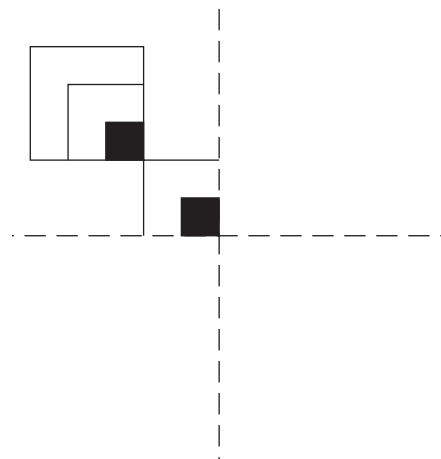
(f)



(g)



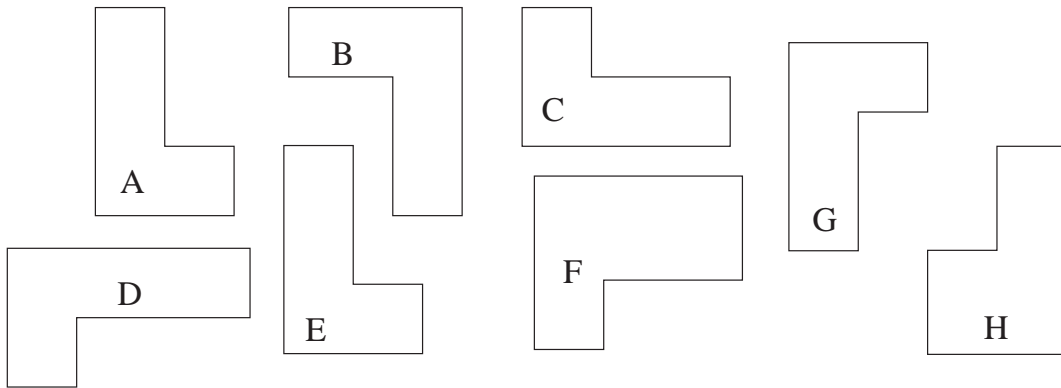
(h)



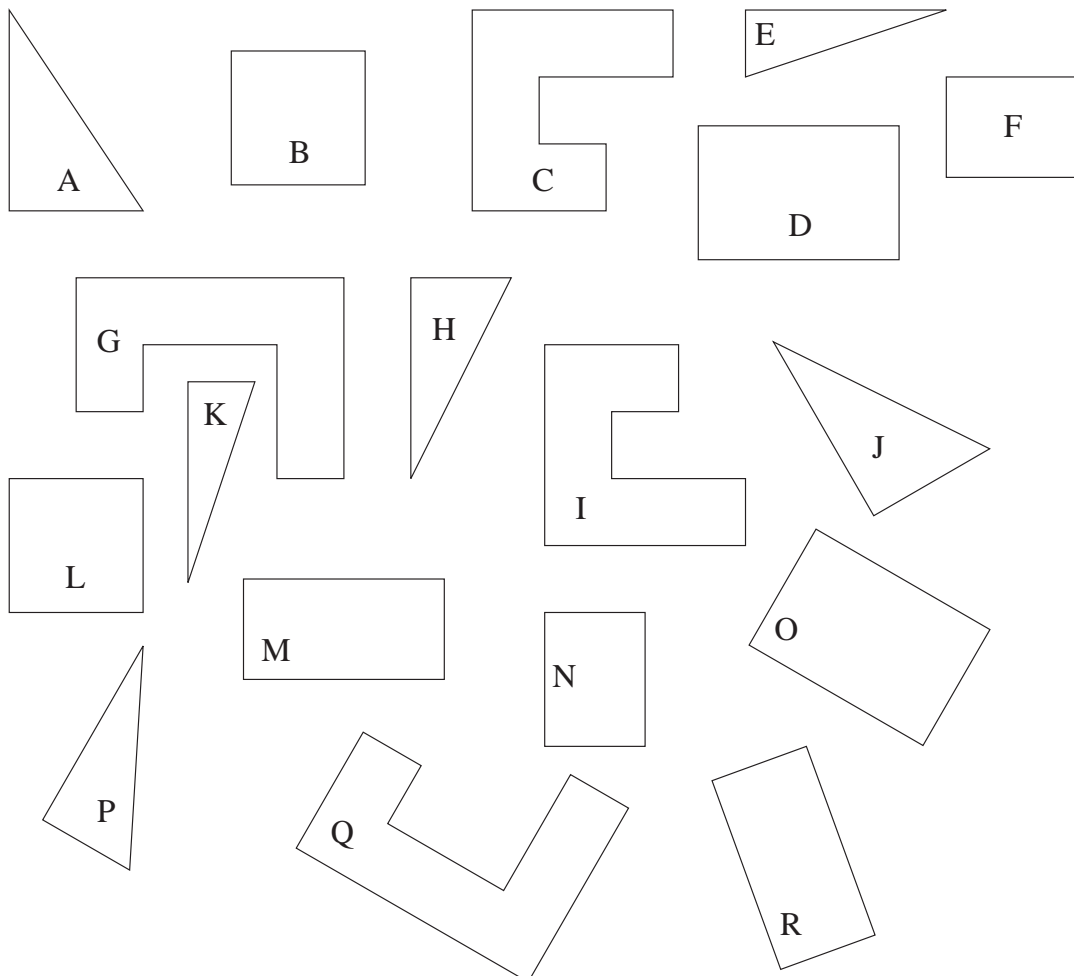
4. Design a symmetrical pattern of your own, which has exactly *six* lines of symmetry.

## 9.2 Congruency

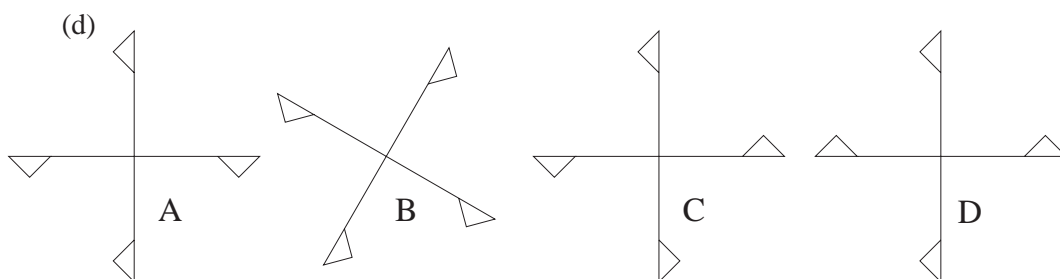
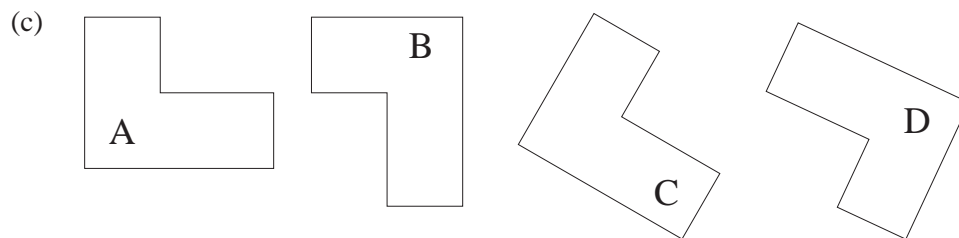
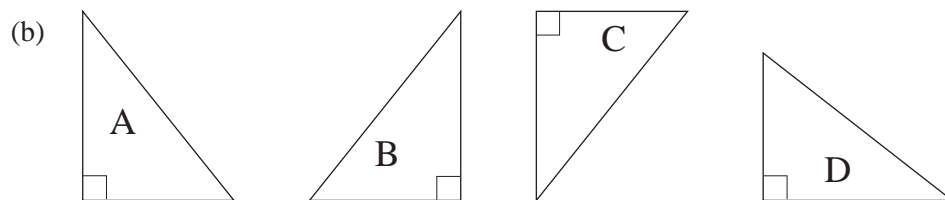
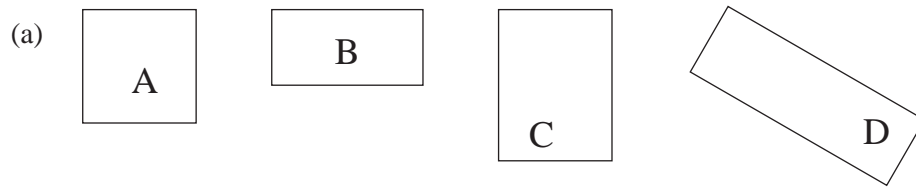
1. Which of the following shapes are *congruent* (i.e. exactly the same)?



2. State which shapes are matching pairs.



3. In each of the following sets of shapes, state which shape is the odd one out.



# 10 Data Analysis 2

## 10.1 Sorting and Classifying Objects

1. Draw a two way table like the one below.

		<i>Sports which</i>	
		<i>are played in teams</i>	<i>have individual competitors</i>
<i>Sports which</i>	<i>use a ball</i>		
	<i>do not use a ball</i>		

Put in the appropriate box sports such as

*Netball, Swimming, Football, Rugby,*  
*Tennis, Running, Archery, Boxing, Cycling,*  
*Cricket, Hockey, Wrestling, Snooker*

Explain why it is difficult to decide where some sports (e.g. *Rowing*) should be placed.

2. (a) Put the following numbers in the appropriate place in a two way table like the one below.

*2, 3, 4, 5, 6, 7, 8, 9*

	<i>EVEN</i>	<i>ODD</i>
<i>PRIME</i>		
<i>Not PRIME</i>		

- (b) Repeat the exercise for the set of numbers

*10, 11, 12, ..., 19*

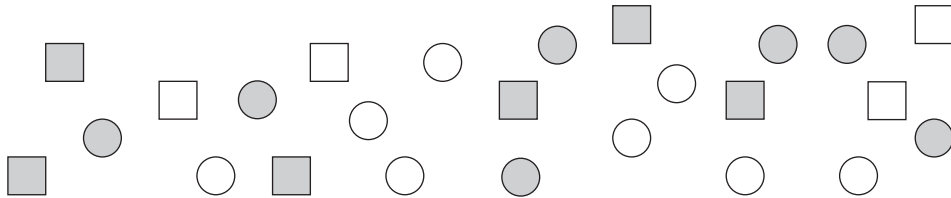
3. These are the names and ages of a group of children going to a party.

<i>Name</i>	<i>Age</i>	<i>Name</i>	<i>Age</i>
Mary	14	Tom	15
Harry	14	Sarah	14
Justin	15	John	13
Gwen	13	Tim	14
Jill	12	Jane	12





Classify them in a two way table like this.

	<i>Age</i>	
	<i>13 or less</i>	<i>14 or more</i>
<i>Female</i>		
<i>Male</i>		

4. The following shapes are each either *shaded* or *white* and either *circular* or *square*.



Complete a frequency tally chart like this one

<i>Shape</i>	<i>Tally</i>	<i>Frequency</i>
		
		
		
		
Total		

and complete a two way chart like the one below to show the number in each category.

	<i>Shaded</i>	<i>White</i>
<i>Square</i>		
<i>Circle</i>		

## 10.2 Bar Charts

1. Draw bar charts to show the following information.

(a)

<i>Favourite subject</i>	Maths	English	Science	Technology	French	Geography	History
<i>Frequency</i>	8	4	7	5	3	2	1

(b)

<i>Favourite sport</i>	Football	Netball	Athletics	Cricket	Tennis	Swimming
<i>Frequency</i>	12	1	8	2	4	3

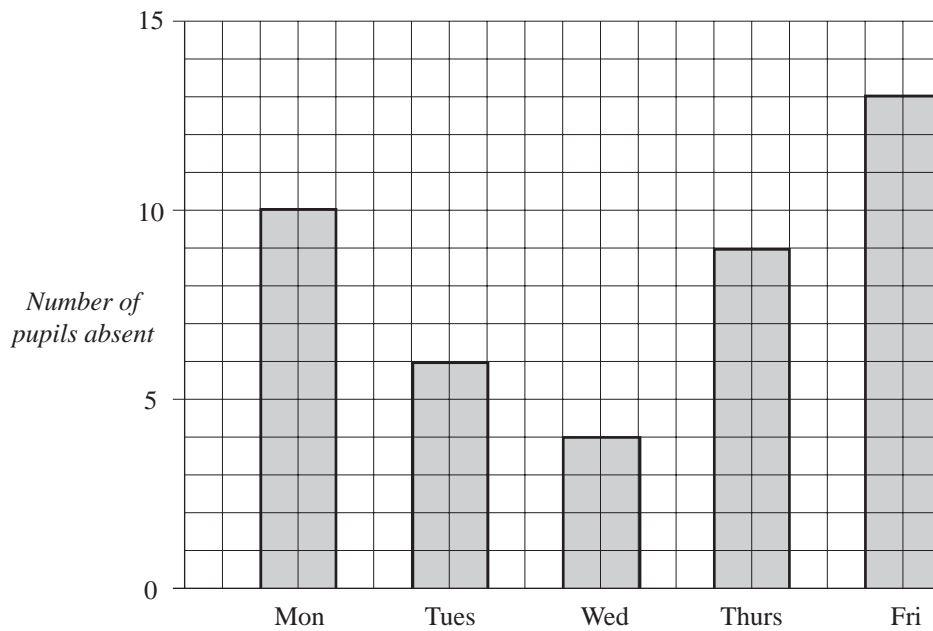
(c)

<i>No. of TVs in your home</i>	0	1	2	3	4 or more
<i>Frequency</i>	3	15	10	2	0

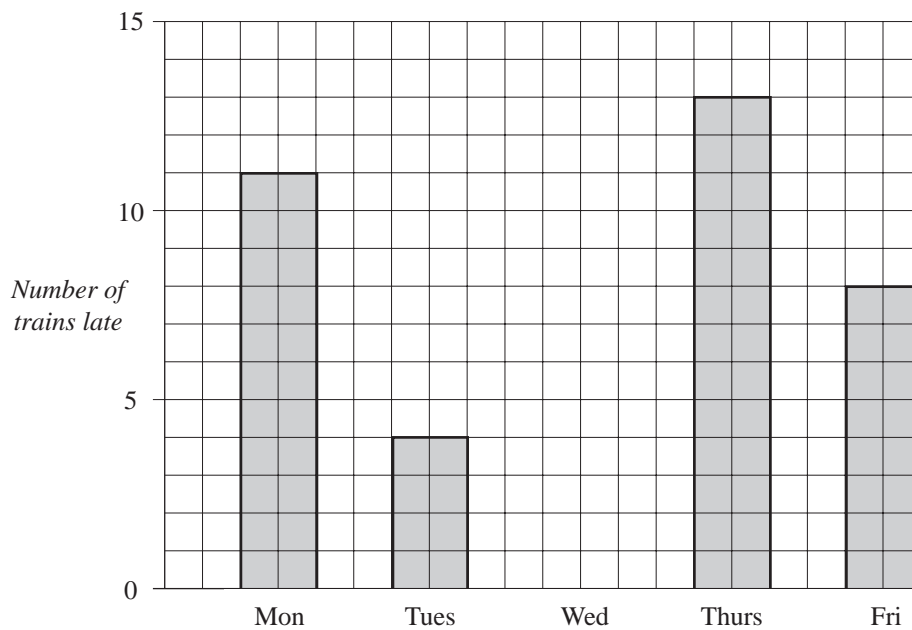
(d)

<i>No. of goals scored in 25 matches</i>	0	1	2	3	4	5 or more
<i>Frequency</i>	7	9	6	2	1	0

2. The bar chart shows the numbers of pupils absent during one week at a school.



- (a) On which day was the *largest* number of pupils absent?  
(b) On which day was the *smallest* number of pupils absent?  
(c) How many more pupils were absent on Monday than on Wednesday?
3. The bar chart shows the number of trains late on a route each day during one week.

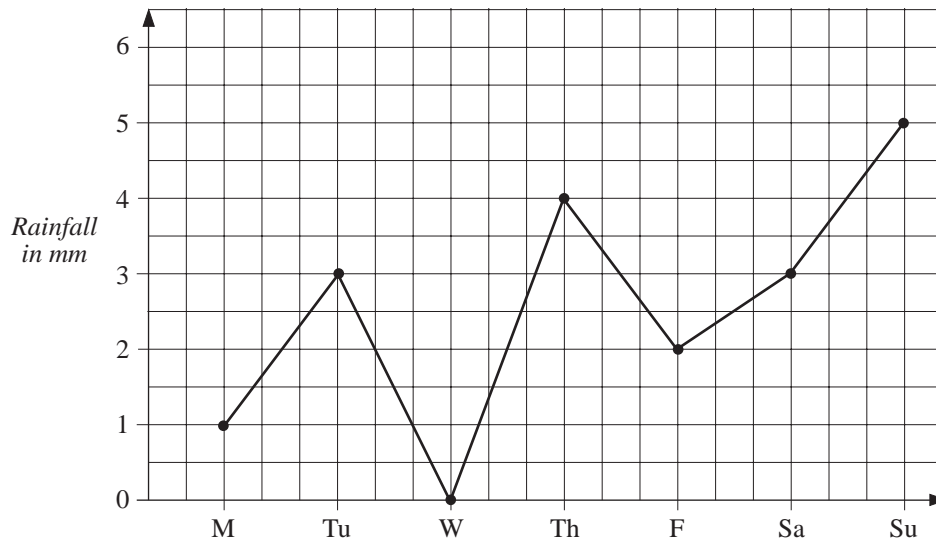


- (a) On which day was the *largest* number of trains late?  
(b) On which day was the *smallest* number of trains late?

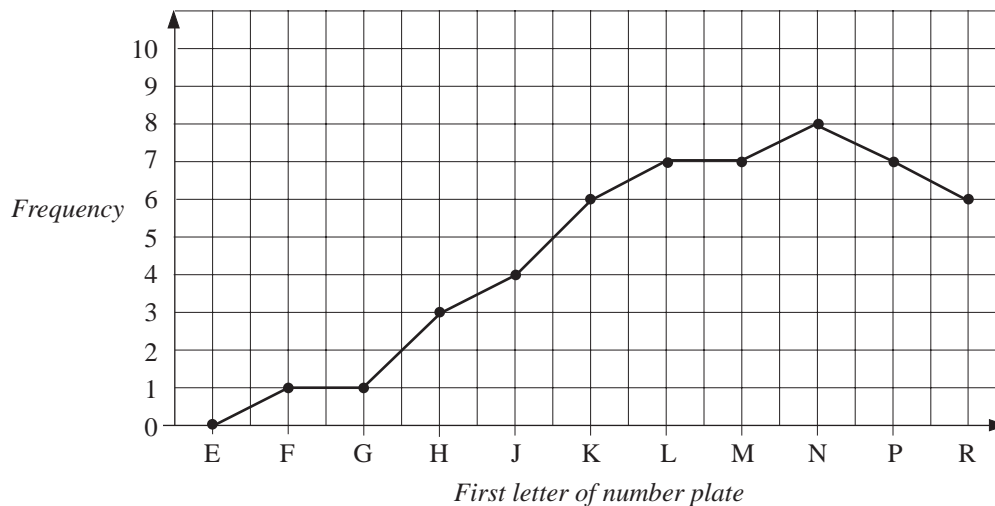
- (c) When were 4 trains late?  
 (d) When were twice as many trains late as on Tuesday?

## 10.3 Interpreting Simple Line Graphs

1. The daily rainfall over one week is shown by the graph.

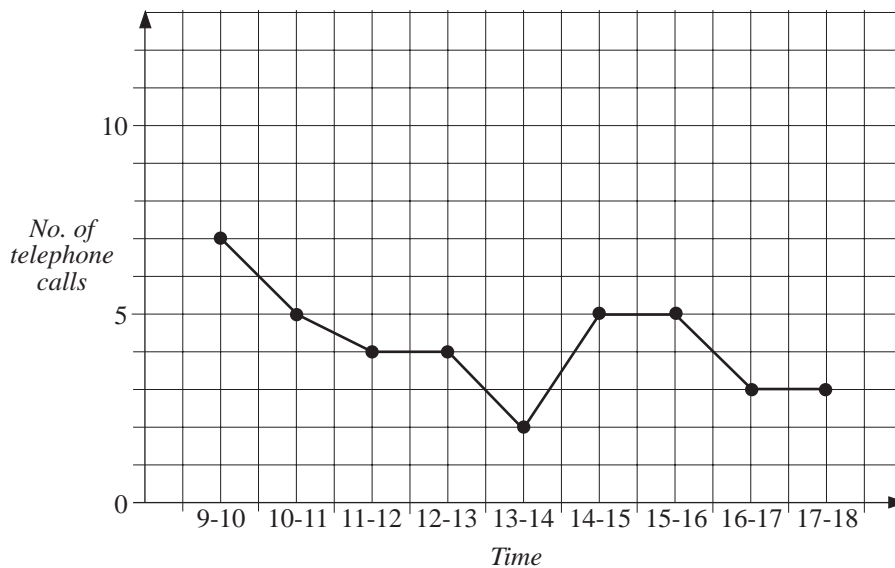


- (a) How many mm of rain fell on Thursday?  
 (b) Which day had *most* rainfall?  
 (c) Which day had *no* rainfall?  
 (d) Which two days had the *same* rainfall?
2. The first letter on a car number plate tells you when the car was first registered. A traffic survey gave the following frequency of letters.



- (a) Which letter occurred most?  
 (b) How many cars in total had the letter M, N, P or R?  
 (c) How many cars in total had other letters?

3. The number of telephone calls to a company for each hour during the day is shown in the graph.



- (a) How many calls were made between  
 (i) 0900 - 1000 hours      (ii) 0900 - 1300 hours  
 (b) Which hour had the *largest* number of calls?  
 (c) Which hour had the *smallest* number of calls?

# 11 Chance

## 11.1 Describing Probabilities

1. Which of these descriptions

*impossible*      *unlikely*      *likely*      *certain*

is best to describe each of the following events?

- (a) You will be 100 years old next year  
 (b) You will captain England at football

- (c) It will rain tomorrow
- (d) It will snow in London on 1 July next year
- (e) You will watch TV tonight
- (f) It will be light at midday tomorrow
- (g) You will get all your maths exercises correct

2. Write these terms in order of *increasing* probability (the least likely one will be first in your list).

*poor chance    certain    no chance    even chance    good chance*

3. Which of the following descriptions best represents each of the following events:

*no chance    unlikely    even chance    likely    certain*

- (a) Arsenal will win the F A Cup next year
- (b) You will be Prime Minister next week
- (c) You will travel by plane on your next holiday
- (d) Your family will win the National Lottery next Saturday
- (e) One of the next 7 days will be a Sunday
- (f) You will win an Olympic Gold Medal for high jump in the year 2000

4. Say whether these things

*will happen*

*could happen*

or *will not happen*

- (a) It will rain tomorrow
- (b) England will win the next Football World Cup
- (c) Next year will be the year 2000
- (d) The year 2000 will be a leap year
- (e) The world high jump record will be more than 3 metres by the year 2050
- (f) There will be 12 months in the next year

# 12 Number Concepts 3

## 12.1 Place Value

The number 3.14 means  
3 units, 1 tenth and 4 hundredths

1. Write as decimal numbers
  - (a) 5 units and 3 tenths
  - (b) 7 units, 2 tenths and 5 hundredths
  - (c) 2 tens, 5 units and 3 tenths
  - (d) 5 tens, 3 tenths and 4 hundredths
  - (e) 3 units, 7 tenths, 4 hundredths and 2 thousandths
  - (f) 1 unit, 3 tenths and 5 thousandths
  
2. In the number 5.21, the 2 represents 2 tenths.  
In the following numbers state the value of the 2.
  - (a) 5.125
  - (b) 3.25
  - (c) 7.152
  - (d) 4.02
  
3. Write as a number
  - (a) twenty three point five
  - (b) sixty two point four
  - (c) one hundred and sixteen point two
  - (d) five hundred and seventy four point six
  - (e) two hundred and seven point three
  - (f) thirty nine point two seven
  - (g) forty one point eight six
  - (h) five point two nine
  - (i) eighteen point eight eight
  - (j) three hundred point six two

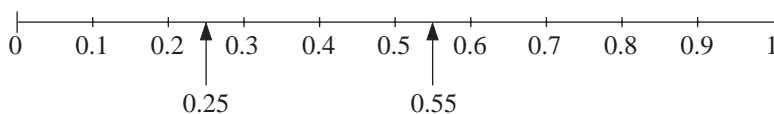
- (k) five hundred and seven point five seven
- (l) six point nought eight
- (m) nine point nought five
- (n) twenty three point nought seven
- (o) sixty four point nought nine
- (p) fifty point nought six
- (q) eight hundred and six point nought one
- (r) nought point six seven
- (s) nought point nought five
- (t) one point nought nought seven

## 4. Write in words

- |           |           |          |
|-----------|-----------|----------|
| (a) 3.7   | (b) 6.9   | (c) 17.4 |
| (d) 28.2  | (e) 3.28  | (f) 8.45 |
| (g) 12.14 | (h) 71.83 | (i) 20.1 |
| (j) 6.02  | (k) 15.03 | (l) 0.7  |
| (m) 0.07  | (n) 10.10 | (o) 3.33 |

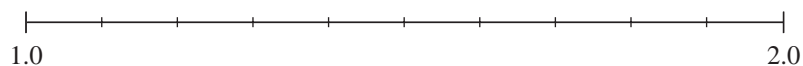
It is helpful to use number lines to represent decimals.

For example, all numbers given to one decimal place, between 0 and 1 can be shown as below.



Numbers such as 0.25 and 0.55 can also be easily shown.

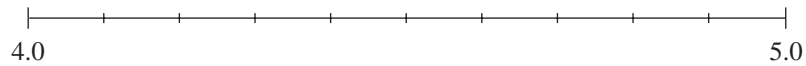
## 5. Copy this number line



and mark on your line

- |         |         |         |         |
|---------|---------|---------|---------|
| (a) 1.5 | (b) 1.1 | (c) 1.7 | (d) 1.9 |
|---------|---------|---------|---------|

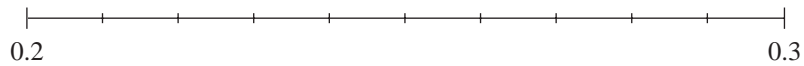
6. Copy this number line



and mark on your line

- (a) 4.3                      (b) 4.9                      (c) 4.1                      (d) 4.7

7. Copy this number line



and mark on your line

- (a) 0.25                      (b) 0.21                      (c) 0.28                      (d) 0.27

8. For each of these sets of numbers, put them in order, *smallest* first.

- (a) 4.25, 4.52, 4.5, 4.2, 4.19  
 (b) 0.57, 0.61, 0.19, 0.09, 0.6  
 (c) 12.5, 10.9, 11.08, 11.7, 6.79

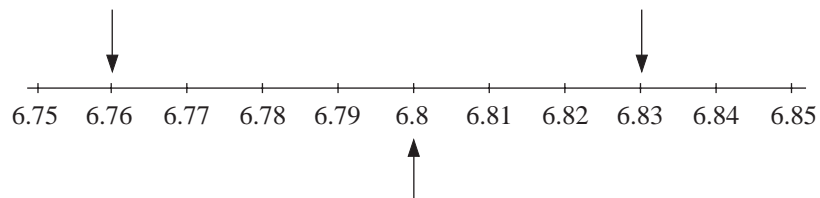
### Example

Find a number given to one decimal place, between 6.76 and 6.83.

### Solution

You can easily find the answer by looking at the numbers on a number line.

The answer must be 6.8.



9. Find a number given to one decimal place between

- (a) 2.47 and 2.52  
 (b) 5.79 and 5.83  
 (c) 0.65 and 0.71

10. Find a number given to two decimal places between
- (a) 5.673 and 5.687
  - (b) 0.509 and 0.519
  - (c) 8.379 and 8.383

## 12.2 Money Calculations

1. What is the total cost of a £4.70 book and a £6.10 game?  
How much change would you get from a £20 note?

2. What is the total cost of a lunch made up of

<i>Chips</i>	80p	<i>Doughnut</i>	25p
<i>Beefburger</i>	£1 .10	<i>Drink</i>	30p

How much change would you get from a £5 note?

3. You buy 5 drinks, each costing 35p.  
How much, in £s, is the total cost?
4. A group of students bought 5 tickets at £1.20 and 3 tickets at £1.60.  
What was the total cost?
5. Library fines collected one day were
- |     |     |       |     |     |       |     |
|-----|-----|-------|-----|-----|-------|-----|
| 10p | 25p | £1.25 | 15p | 75p | £1.10 | 25p |
|-----|-----|-------|-----|-----|-------|-----|
- How much money was collected that day?
6. Theme Park tickets cost £7.50 for each adult and £3.20 for each child.  
How much would it cost for a party of 3 adults and 8 children?
7. How much will it cost in total to buy
- |                             |     |                              |
|-----------------------------|-----|------------------------------|
| 3 kg of sugar at 72p per kg | and | 4 kg of flour at 24p per kg? |
|-----------------------------|-----|------------------------------|

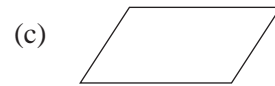
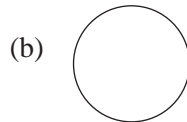
8. At the fruit shop you buy  
 4 lbs of apples at 38p per pound,                      3 lbs of bananas at 45p per pound  
 2 lbs of grapes at £1.10 per pound
- What is the total cost of your fruit?
9. A shop was paid the following cheques one day.  
                   £20.50      £17.75      £102      £5.67      £27.09
- Put the cheques in order, smallest first.
- What is the total value of all the cheques?

## 12.3 Fractions of Quantities

1. Find
- |                         |                         |                         |
|-------------------------|-------------------------|-------------------------|
| (a) $\frac{1}{2}$ of 20 | (b) $\frac{1}{4}$ of 16 | (c) $\frac{3}{4}$ of 16 |
| (d) $\frac{1}{2}$ of 18 | (e) $\frac{3}{4}$ of 20 | (f) $\frac{1}{2}$ of 22 |
| (g) $\frac{1}{4}$ of 8  | (h) $\frac{1}{2}$ of 30 | (i) $\frac{3}{4}$ of 8  |
| (j) $\frac{1}{2}$ of 50 | (k) $\frac{1}{4}$ of 24 | (l) $\frac{3}{4}$ of 40 |
| (m) $\frac{1}{2}$ of 32 | (n) $\frac{1}{4}$ of 32 | (o) $\frac{3}{4}$ of 32 |
2. Calculate
- |                            |                            |                            |
|----------------------------|----------------------------|----------------------------|
| (a) $\frac{1}{2}$ of £6    | (b) $\frac{1}{4}$ of £12   | (c) $\frac{1}{4}$ of 20 kg |
| (d) $\frac{3}{4}$ of £12   | (e) $\frac{1}{2}$ of 80p   | (f) $\frac{1}{4}$ of 60 cm |
| (g) $\frac{1}{2}$ of £25   | (h) $\frac{3}{4}$ of 80 m  | (i) $\frac{1}{2}$ of 10 kg |
| (j) $\frac{1}{2}$ of 500 g | (k) $\frac{3}{4}$ of 200 m | (l) $\frac{1}{4}$ of 40p   |

- (m)  $\frac{1}{4}$  of £25      (n)  $\frac{1}{2}$  of £35      (o)  $\frac{3}{4}$  of 60 kg  
 (p)  $\frac{1}{4}$  of 500 cm      (q)  $\frac{3}{4}$  of £1      (r)  $\frac{1}{4}$  of £2

3. Copy and shade in  $\frac{3}{4}$  of each of the following shapes.



4. 400 pupils had lunch at school one day.

- (a)  $\frac{1}{2}$  of them had a hot meal.  
How many had a hot meal?

- (b)  $\frac{3}{4}$  of them had chips.  
How many had chips?

5. Find

- (a)  $\frac{1}{2}$  of 500      (b)  $\frac{1}{4}$  of 100      (c)  $\frac{3}{4}$  of 100  
 (d)  $\frac{1}{4}$  of 200      (e)  $\frac{1}{2}$  of 600      (f)  $\frac{3}{4}$  of 400  
 (g)  $\frac{3}{4}$  of 500      (h)  $\frac{1}{4}$  of 400      (i)  $\frac{1}{4}$  of 500  
 (j)  $\frac{1}{2}$  of 300      (k)  $\frac{3}{4}$  of 800      (l)  $\frac{1}{2}$  of 260  
 (m)  $\frac{1}{4}$  of 800      (n)  $\frac{1}{2}$  of 700      (o)  $\frac{3}{4}$  of 600

6. 300 tickets for the school bus were sold in a week.

- (a)  $\frac{1}{2}$  of them were sold to boys.

How many of the tickets were sold to boys?

- (b)  $\frac{3}{4}$  of the tickets were sold to pupils under 12 years old.

How many pupils under 12 years old bought tickets that week?

7. A college sold 500 tickets for a concert.

- (a)  $\frac{3}{4}$  of the tickets were bought by parents.

How many parents bought tickets?

- (b)  $\frac{1}{2}$  of the tickets were for seats in the balcony.

How many balcony seat tickets were sold?

## 12.4 Negative Numbers

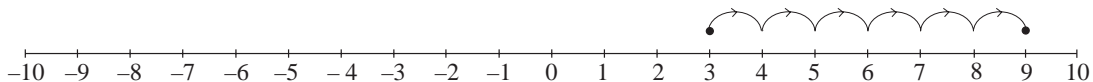
### Example

(a)  $3 + 6$

(b)  $4 - 7$

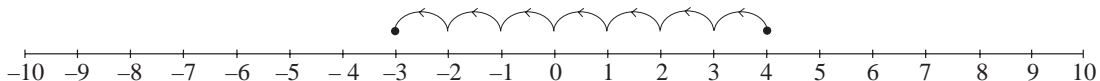
### Solution

- (a) Start at 3 and count 6 places to the *right*.



$$3 + 6 = 9$$

- (b) Start at 4 and count 7 places to the *left*.



$$4 - 7 = -3$$

Draw your own number line to help you with this exercise.

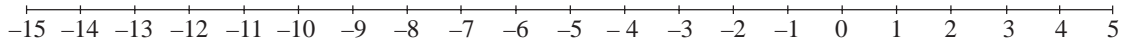
1. (a)  $-3 + 6$       (b)  $-2 + 2$       (c)  $-5 + 8$       (d)  $-8 + 6$   
 (e)  $3 + 5$       (f)  $-7 + 12$       (g)  $-5 + 10$       (h)  $-3 + 12$

2. (a)  $6 - 9$  (b)  $-3 - 2$  (c)  $8 - 12$  (d)  $4 - 3$   
 (e)  $7 - 15$  (f)  $-5 - 3$  (g)  $9 - 13$  (h)  $0 - 6$
3. (a)  $3 + 2 - 5$  (b)  $4 - 6 + 8$  (c)  $7 - 9 + 5$  (d)  $8 - 14 + 3$   
 (e)  $-2 + 6 - 5$  (f)  $-2 - 2 - 2$  (g)  $-8 + 10 - 5$  (h)  $-6 + 11 - 10$

4. The temperatures one day in winter in a number of European cities are shown below.

<i>Moscow</i>	$-15\text{ }^{\circ}\text{C}$	<i>London</i>	$2\text{ }^{\circ}\text{C}$
<i>Frankfurt</i>	$10\text{ }^{\circ}\text{C}$	<i>Budapest</i>	$-3\text{ }^{\circ}\text{C}$
<i>Oslo</i>	$-8\text{ }^{\circ}\text{C}$	<i>Athens</i>	$5\text{ }^{\circ}\text{C}$

You might find it helpful to use a number line like this to help you answer the following questions.

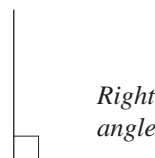


- (a) Which was the coldest city that day?
- (b) Which was the warmest city that day?
- (c) What is the difference in temperature between the coldest and the warmest cities?
- (d) What is the difference in temperature between
- London* and *Moscow*?
  - Budapest* and *Frankfurt*?
  - Oslo* and *Moscow*?
  - Athens* and *Budapest*?
5. The air temperature is  $-5\text{ }^{\circ}\text{C}$ . With a wind speed of 30 mph the effective air temperature feels  $10\text{ }^{\circ}\text{C}$  colder.  
 What is the effective air temperature?
6. Put these sets of numbers in order, *smallest* first.
- $-4, 5, -2, 7, -1$
  - $-5, -10, -3, -2, -6$
  - $20, -31, 25, -5, 15, -9$
  - $-21, -27, -15, -22, -31$

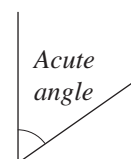
# 13 Angles and Compass Directions

## 13.1 Angles

The angle between two lines which are at  $90^\circ$  to each other is called a *right angle*.



If the angle is *less* than  $90^\circ$  it is called an *acute angle*.

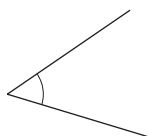


If the angle is *greater* than  $90^\circ$  and less than  $180^\circ$  it is called an *obtuse angle*.

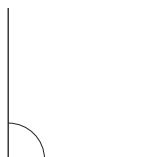


1. For each angle, say whether it is an *acute angle*, a *right angle* or an *obtuse angle*.

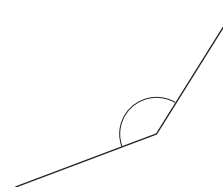
(a)



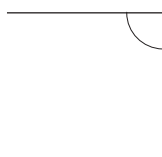
(b)



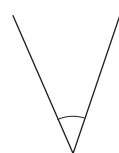
(c)



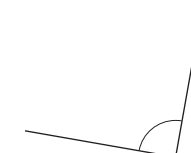
(d)



(e)



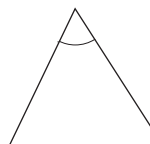
(f)



(g)



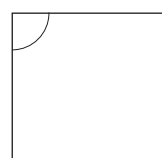
(h)



(i)



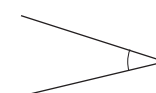
(j)



(k)



(l)



2. Draw a triangle with

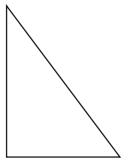
- (a) one right angle
- (b) three acute angles
- (c) one obtuse angle

3. For these shapes, state how many

*acute angles, right angles and obtuse angles*

there are.

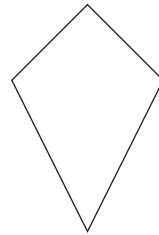
(a)



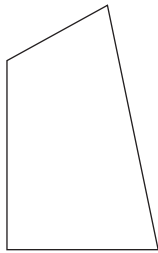
(b)



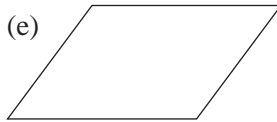
(c)



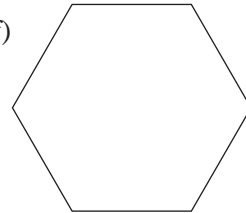
(d)



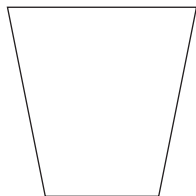
(e)



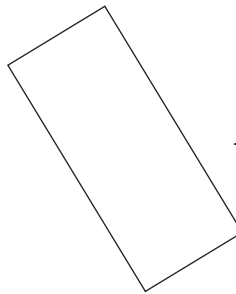
(f)



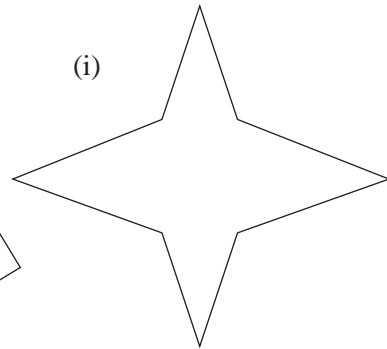
(g)



(h)

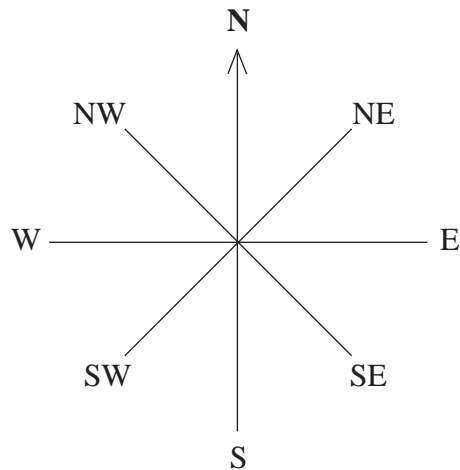


(i)

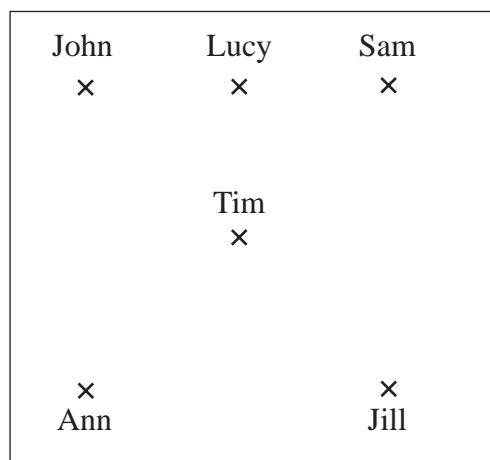


## 13.2 Compass Directions

The eight main compass directions are shown here. They are north (N), south (S), east (E), west (W), north-east (NE), north-west (NW), south-east (SE), south-west (SW).



1. The sketch shows the homes of six friends.



Who lives

- |                       |                        |
|-----------------------|------------------------|
| (a) north of Tim      | (b) south of Sam       |
| (c) south-west of Tim | (d) north-west of Tim? |

What is the direction of

- |                    |                    |
|--------------------|--------------------|
| (e) Lucy from Tim  | (f) Tim from Sam   |
| (g) John from Jill | (h) Sam from Tim   |
| (i) Ann from John  | (j) Jill from Tim? |

2. Draw points each the same distance from a fixed point, O, so that
- A is due east of O
  - B is NW of O
  - C is SW of O
  - D is S of O
  - E is NE of O

# 14 Number Machines 1

## 14.1 Equations

### Example

Find  when

$$\square + \square = 16$$

### Solution

Since  $8 + 8 = 16$

$$\square = 8$$

1. In each case, find the value of the unknown .

(a)  $\square + \square = 10$

(b)  $12 - \square = \square$

(c)  $\square + \square = 18$

(d)  $\square - 4 = 8 - \square$

(e)  $20 - \square = \square$

**Example**Find  $\triangle$  when

$$\triangle \times \triangle = 9$$

**Solution**Since  $3 \times 3 = 9$ 

$$\triangle = 3$$

2. In each case, find the value of the unknown  $\triangle$ .

(a)  $\triangle + \triangle = 16$

(b)  $\triangle \times \triangle = 25$

(c)  $\triangle = 36 \div \triangle$

(d)  $100 \div \triangle = \triangle$

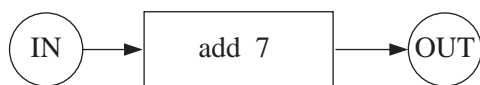
(e)  $\triangle \times \triangle = 49$

(f)  $\triangle = 64 \div \triangle$

**14.2 Simple Machines**

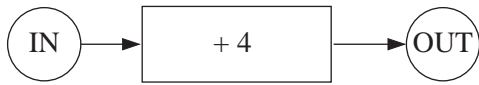
For each function machine, copy and complete the table.

1.



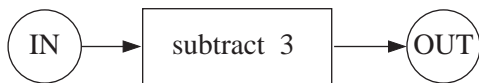
<i>Number in</i>	<i>Number out</i>
3	?
7	?
?	13
?	17
?	28

2.



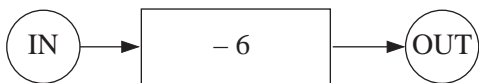
<i>Number in</i>	<i>Number out</i>
12	?
17	?
?	17
?	21

3.



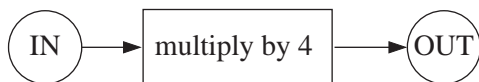
<i>Number in</i>	<i>Number out</i>
7	?
8	?
?	17
?	21

4.



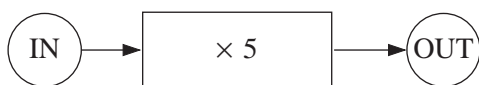
<i>Number in</i>	<i>Number out</i>
13	?
18	?
?	39
?	47

5.



<i>Number in</i>	<i>Number out</i>
2	?
5	?
?	28
?	36

6.



<i>Number in</i>	<i>Number out</i>
4	?
6	?
?	40
?	45

7.



<i>Number in</i>	<i>Number out</i>
12	?
18	?
?	5
?	9

# 15 Weighing, Measuring, Time

## 15.1 Capacity

- Would you use *litres* or *millilitres* to measure
  - a spoonful of medicine
  - the capacity of a bath
  - the capacity of a watering can
  - a small drink?

*Note that*



$$1 \text{ litre} = 1000 \text{ millilitres}$$

- Convert to millilitres
 

(a) 2 litres	(b) 5 litres	(c) $\frac{1}{2}$ litre
(d) $1\frac{1}{2}$ litres	(e) 10 litres	(f) $\frac{1}{4}$ litres
- Convert to litres

## 15.2 Metric Measures of Length

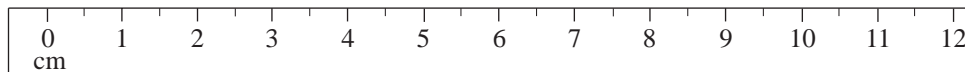
1. Write down the length, in centimetres, of each of these straight lines.

**A** \_\_\_\_\_

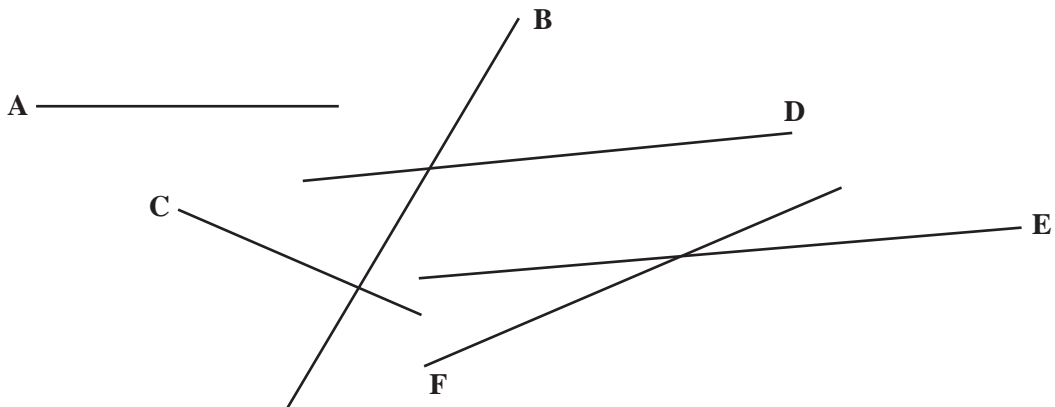
**B** \_\_\_\_\_

**C** \_\_\_\_\_

**D** \_\_\_\_\_



2. Measure, in cm, and write down the length of each of these straight lines.



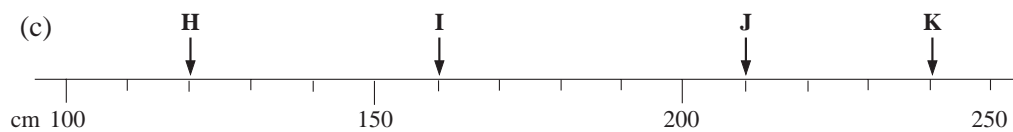
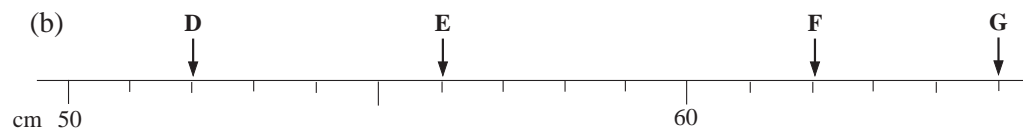
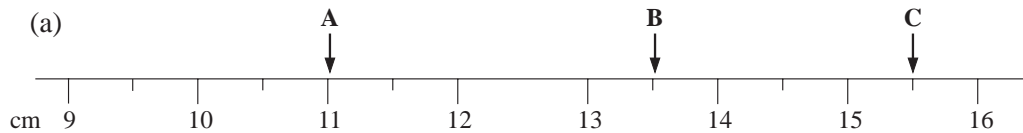
3. Using a ruler draw straight lines of the following lengths.

(a) 8 cm                      (b) 12.5 cm                      (c) 20 cm                      (d) 3.5 cm

4. Measure, in cm, and write down, the lengths of the sides of these rectangles.

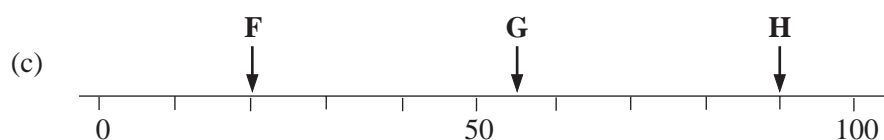
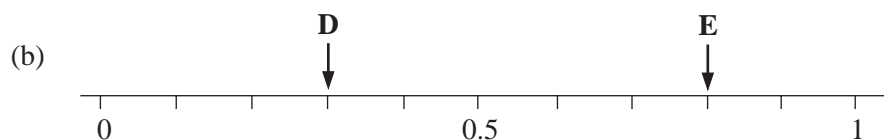
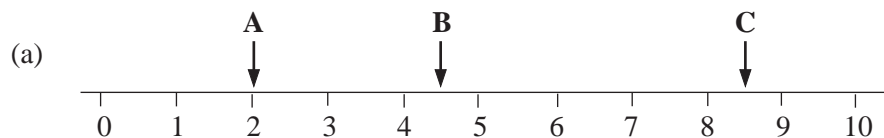


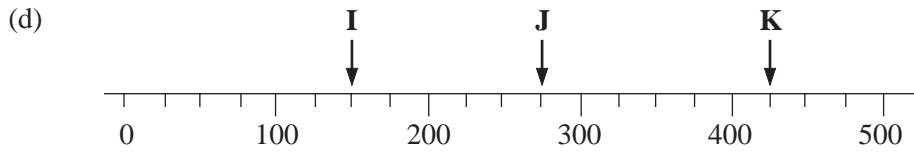
5. Make accurate drawings of the following shapes.
- A square with sides 5 cm long.
  - A rectangle with length 8 cm and width 4.5 cm.
  - A rectangle with length 11 cm and width 3 cm.
  - A square with sides  $7\frac{1}{2}$  cm long.
6. What lengths are the arrows pointing to on these diagrams?



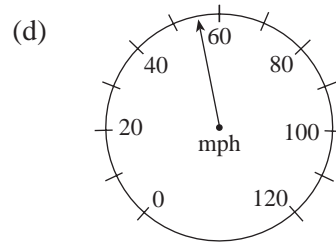
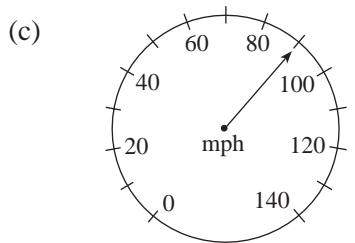
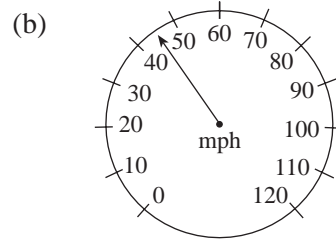
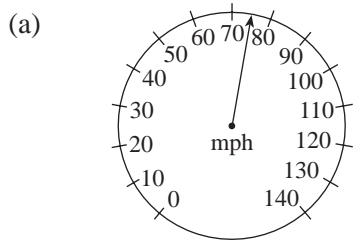
## 15.3 Reading Scales

1. Read the numbers indicated by each of the arrows on the scales below.

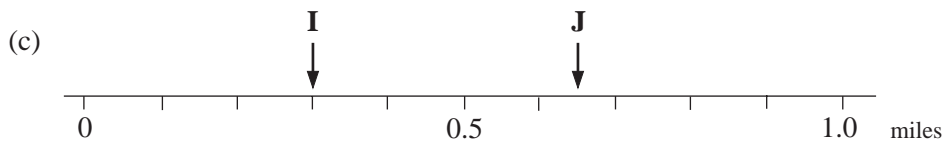
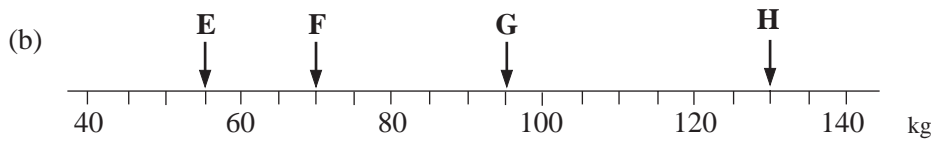
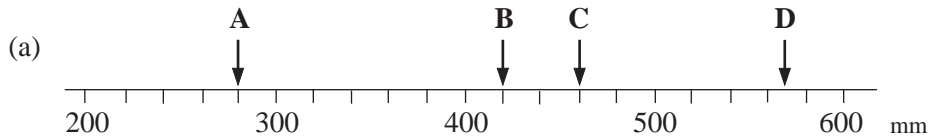




2. Read off the speed indicated on each of the speedometers.



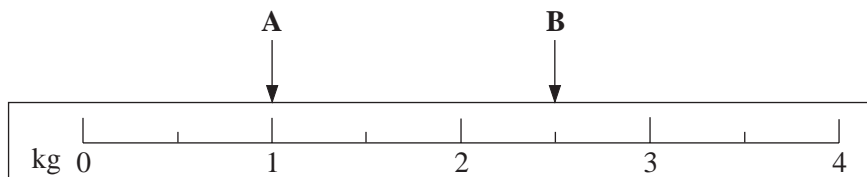
3. Read off the numbers indicated on each of these scales.



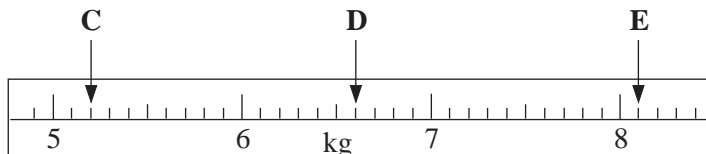
4. On each diagram the arrows are pointing to weights on a scale.

Write down the weights shown by the arrows.

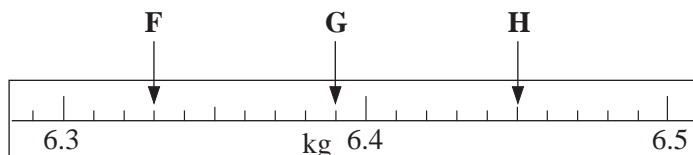
(a)



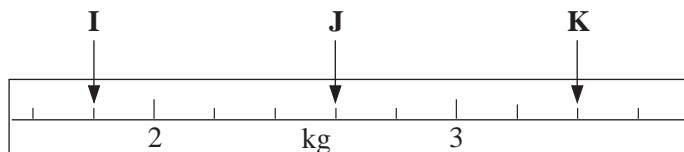
(b)



(c)



(d)



## 15.4 Clock Reading

*Note that*

60 seconds = 1 minute

60 minutes = 1 hour

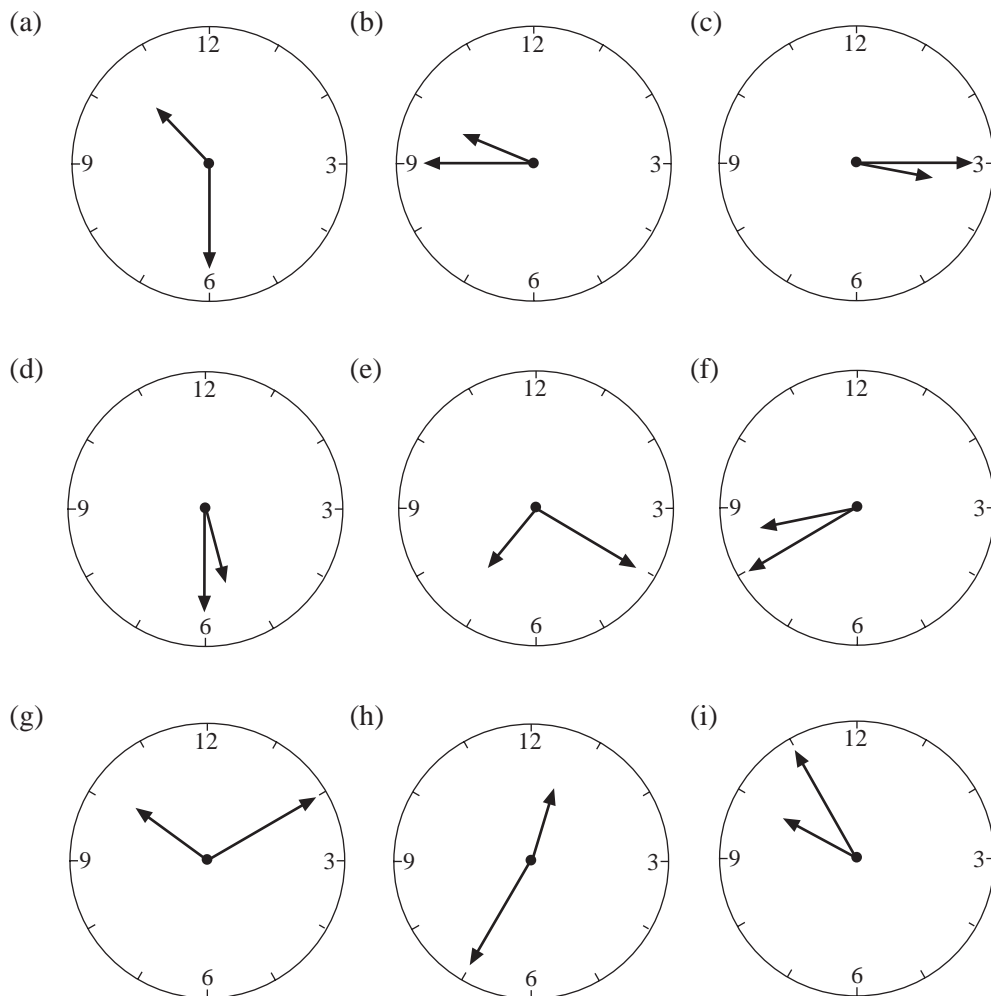
24 hours = 1 day

1. What measurement of time would you usually use for
  - (a) the length of a TV programme
  - (b) the time taken to run 200 metres
  - (c) the journey time from London to Edinburgh by car
  - (d) the time taken to buy the week's groceries in a supermarket
  - (e) the time taken for the moon to make a rotation of the earth?

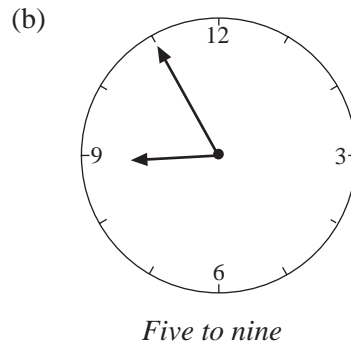
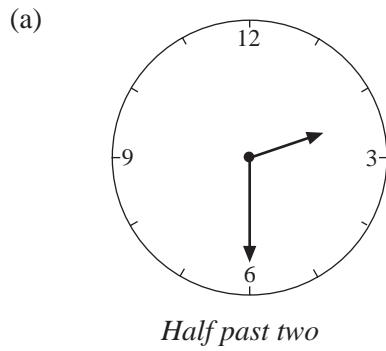
## 2. Convert

- (a) 2 hours to minutes
- (b) 3 minutes to seconds
- (c) 120 seconds to minutes
- (d) 4 days to hours
- (e) 150 minutes to hours
- (f) 90 seconds to minutes
- (g) 1 hour to seconds
- (h) 1 day to minutes
- (i) 1 day to seconds

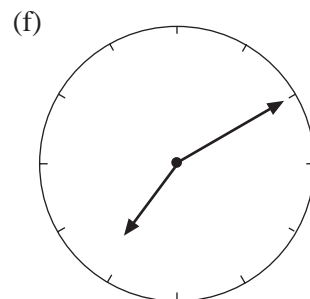
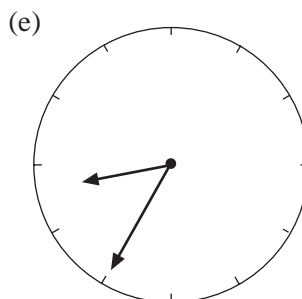
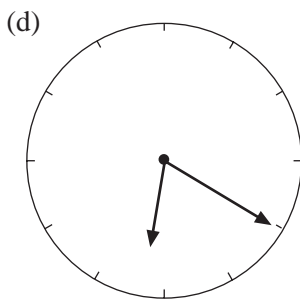
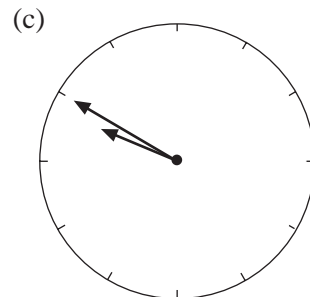
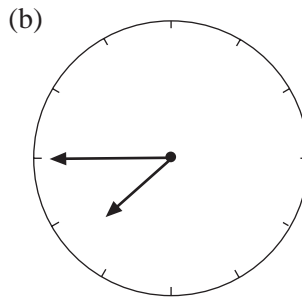
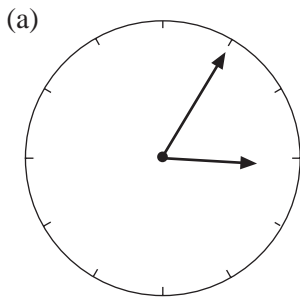
## 3. What time is shown by each of the clocks?



Example



4. Write the times on these clocks as 'to' and 'past' times.



5. Draw clock faces with hands marked to show

(a) 11.00

(b) 2.30

(c) 4.15

(d) 6.30

(e) 8.45

(f) 10.20

# Miscellaneous Exercises

1. During a cricket season John scored seven hundred and six runs, Peter scored three hundred and forty nine runs and Khan scored five hundred and ninety runs.

(a) Write these scores in numbers instead of words.

e.g. John scored . . . runs.

(b) Who scored most runs?

2. Copy and complete this bill.

*Apples* 4 kg at 43p per kg = £

*Bananas* 3 kg at 69p per kg = £

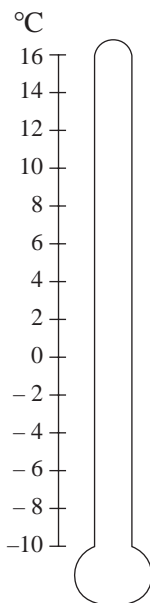
**Total** £

3. The number of people at a pop concert was 7845.

(a) Write this number to the nearest 100.

(b) Write this number to the nearest 1000.

4.



(a) At midnight the temperature was  $-6^{\circ}\text{C}$  and at midday it was  $8^{\circ}\text{C}$ .

What was the increase in temperature from midnight to midday?

(b) On another night the temperature was  $-3^{\circ}\text{C}$  and there was an  $11^{\circ}\text{C}$  increase by the next midday.

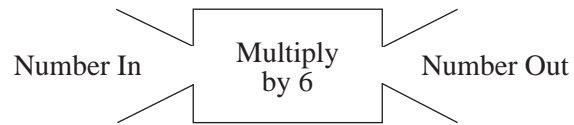
What was the temperature at midday?

5. Tom saves £14 a month for 3 months and £10 a month for the next 5 months.

How much has he saved altogether?

If he wants to buy a music system costing £100, how much more money does he need?

6. This is a number machine.



- (a) If the Number In is 7, find the Number Out.  
 (b) If the Number Out is 30, find the Number In.
7. Write the missing numbers for the shapes below.

(a)  $\square + \square = 24$

(b)  $\triangle \times \triangle = 25$

(c)  $36 \div \bigcirc = \bigcirc$

(d)  $\diamond \times \diamond \times \diamond = 8$

8. 400 people travelled on the train from London to Newcastle  
 The train called at York and Durham.

(a)  $\frac{1}{2}$  of the people got off at York.

How many people got off at York?

(b)  $\frac{1}{4}$  of the people got off at Durham.

How many people got off at Durham?

- (c) How many people travelled to Newcastle?

9.

### *CARS FOR SALE*

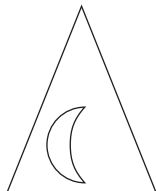
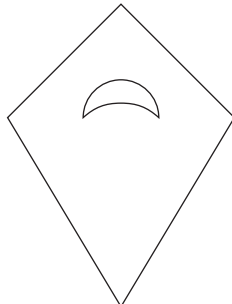
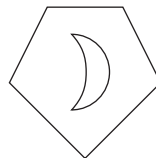
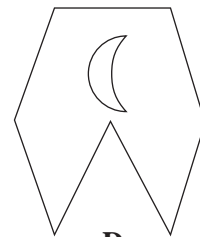
<i>FORD MONDEO</i>	£10 420
<i>RENAULT LAGUNA</i>	£ 9 650
<i>FORD ESCORT</i>	£ 8 500
<i>FORD MONDEO</i>	£11 525
<i>PEUGEOT 407</i>	£10 420
<i>NISSAN PRIMERA</i>	£ 8 600
<i>FORD FIESTA</i>	£ 5 650
<i>CITROEN ZANTIA</i>	£10 500

- (a) How many cars are for sale in total?
- (b) What fraction of the total number are *Ford Mondeos*?
- (c) What fraction of the total number are *Ford* cars?

10. Write these numbers in order, from *smallest* to *largest*.

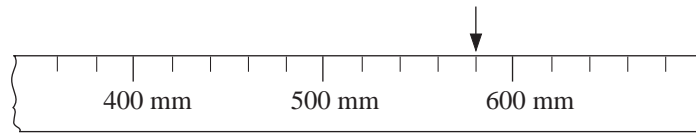
- (a) 3.76    3.9    3.08    3.89    3.21
- (b) -10    -15    -3    -11    -24

11. Which one of these shapes has a line of symmetry?

**A****B****C****D**

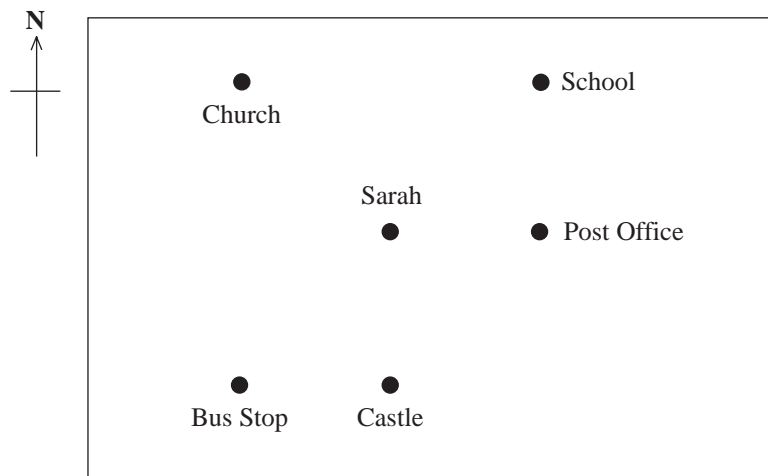
Draw the shape which has a line of symmetry, and mark the line of symmetry.

12. This is part of a tape measure.



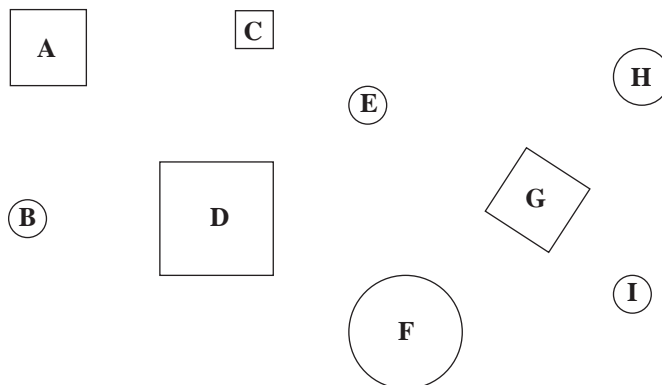
What value is the arrow pointing to?

13. Sarah is standing in the centre of a village as shown.



- What is the direction of the school from Sarah?
- In which direction must Sarah walk to go to the church?
- Copy and complete this sentence,  
*"The castle is due . . . . . of Sarah."*

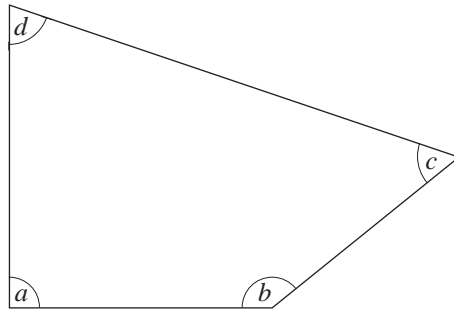
- 14.



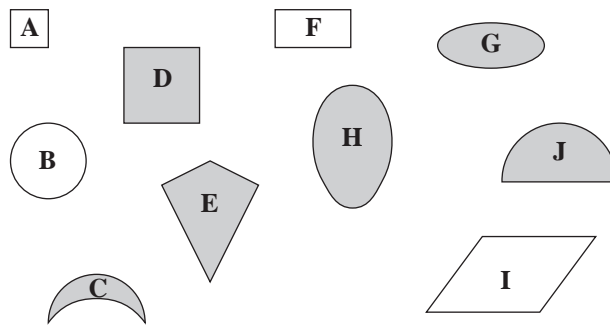
- Which two *squares* are identical in size?
- Which three *circles* are identical in size?
- How many *right angles* are there in shape D?

15. Say whether each angle is

*an acute angle, a right angle or an obtuse angle*



16. Here is a set of objects.



Copy the table and sort the objects into the correct boxes.

	<i>Shape with all edges straight</i>	<i>Shape with some edges curved</i>
<i>Shaded</i>		
<i>Not shaded</i>		

17. Say if each of these things

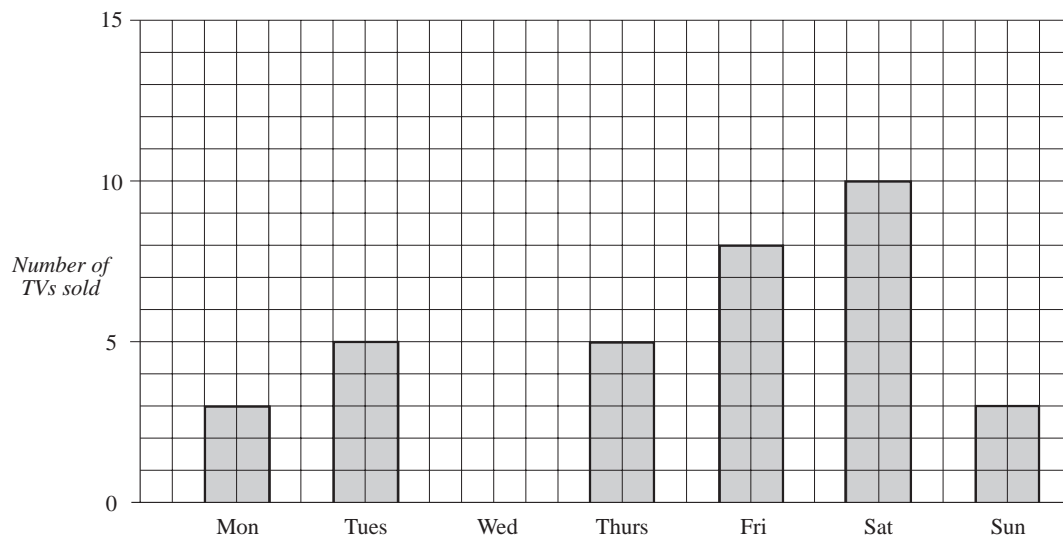
*will happen*

*could happen*

or *will not happen*

- (a) You will be late for school one day next week.
- (b) You will be Minister for Education tomorrow.
- (c) There will be 24 hours in each day next week.
- (d) You will get full marks for your next Mathematics test.

18. The graph shows the number of people who bought a TV in a shop during one week.



- (a) On which day were most TVs sold?
- (b) On which two days were the same number of TVs sold?
- (c) How many more TVs were sold on Friday than on Thursday?
- (d) The shop was closed for one day. Which day was it?