

# Non-calculator skills

## Functional skills maths L1

This booklet contains practice for the for the non-calculator section of the final exam.

This section is worth 15 marks in the final exam you will have 25minutes to complete it.

Non calculator skills make up 25% of the final assessment



### Skills checklist

*Complete this checklist as you work through the book, record areas for improvement*

| Target                                                                                     | R | A | G |
|--------------------------------------------------------------------------------------------|---|---|---|
| Read, write, order and compare large numbers up to one million                             |   |   |   |
| Approximate whole numbers by rounding, including to the nearest 10,100,1000                |   |   |   |
| Approximate decimals by rounding to a whole number or one or two decimal places            |   |   |   |
| Add and subtract using three digit whole numbers                                           |   |   |   |
| Add and subtract negative numbers                                                          |   |   |   |
| Multiply and divide whole numbers and decimals by 10,100,1000                              |   |   |   |
| Multiply 2-digit whole numbers by single and 2 digit whole numbers                         |   |   |   |
| Calculate square numbers                                                                   |   |   |   |
| Divide 3-digit whole numbers by single and double digit whole numbers                      |   |   |   |
| Use Bodmas to solve problems                                                               |   |   |   |
| Add subtract multiply and divide decimals up to 2 decimal places                           |   |   |   |
| Simplify fractions to find equivalent forms                                                |   |   |   |
| Find parts of whole number quantities or measurements, e.g. $\frac{2}{3}$ or $\frac{3}{4}$ |   |   |   |
| Convert mixed fractions                                                                    |   |   |   |
| Recognise and calculate equivalences between common fractions, percentages and decimals    |   |   |   |
| Add and subtract fractions                                                                 |   |   |   |
| Calculate percentages of amounts and simple percentage increase and decrease               |   |   |   |
| Calculate direct proportion                                                                |   |   |   |
| Calculate mean and range                                                                   |   |   |   |
| Express the likelihood of an event using fractions, and on a scale of 0 to 1               |   |   |   |
| Calculate area and perimeter and volume                                                    |   |   |   |
| Recognise and make use of simple scales on maps and drawings                               |   |   |   |
| Calculate angles                                                                           |   |   |   |
| Convert between units of length, weight, capacity, in the same system                      |   |   |   |
| Perform calculations with time                                                             |   |   |   |
| Nets                                                                                       |   |   |   |
| Plans and elevation                                                                        |   |   |   |

### Read, write, order and compare large numbers up to one million

Fill in the place value chart the first one has been done for you

|           | Millions | Hundred thousands | Ten thousands | Thousands | Hundreds | Tens | Units |
|-----------|----------|-------------------|---------------|-----------|----------|------|-------|
| 816 958   |          | 8                 | 1             | 6         | 9        | 5    | 8     |
| 1 254 958 |          |                   |               |           |          |      |       |
| 91 806    |          |                   |               |           |          |      |       |
| 3 048 787 |          |                   |               |           |          |      |       |
| 958 656   |          |                   |               |           |          |      |       |
| 1 362 055 |          |                   |               |           |          |      |       |

Can you write the largest number in words?

**Read, write, order and compare large numbers up to one million**

Compare these numbers using the symbols  $<$   $>$

- 1) 4,322 \_\_\_ 5,322
- 2) 211 \_\_\_ 4,210
- 3) 32,242 \_\_\_ 6,223
- 4) 82,432 \_\_\_ 34,223
- 5) 111,111 \_\_\_ 123,123
- 6) 53,234 \_\_\_ 3,123

Milly has compared the numbers below.

$$2,343 < 34,567$$

Is she correct or incorrect?

Explain your answer.

Place these numbers in **ascending** order:

2,321 64,232 3,216 22,231 655,221 34 38,211

Peter says he can order the following numbers by only looking at the first 3 digits. Is he correct?

Can you explain what he has done wrong?

125381, 125362, 126743, 12582, 127942

**Challenge**

Nasreen has made some five digit numbers, using the digits 1, 2, 3 and 4

She has changed each number into a letter. Use the clues to work out her numbers:

Her numbers are:

- 1) aabdc 2) acdbc 3) dcaba 4) cdadc 5) bdaab

Number 1 is the highest number

The digits in number 4 total 12

Number 3 is the smallest number

**Approximate whole numbers by rounding, including to the nearest 10, 100, 1000 to find the punchline to this joke:**

What kind of snake does a maths teacher own?

| A   | B  | C   | D   | E   | F | G  | H   | I    | J      | K      | L   | M    |
|-----|----|-----|-----|-----|---|----|-----|------|--------|--------|-----|------|
| 300 | 40 | 540 | 390 | 700 | 3 | 90 | 400 | 6000 | 300000 | 400000 | 410 | 3000 |

| N | O  | P   | Q   | R   | S   | T    | U  | V    | W    | X    | Y   | Z  |
|---|----|-----|-----|-----|-----|------|----|------|------|------|-----|----|
| 0 | 30 | 560 | 600 | 400 | 580 | 8000 | 30 | 7600 | 4000 | 8100 | 300 | 10 |

|        | Round<br>296 to the<br>nearest<br>100 | Round<br>555 to the<br>nearest<br>10 | Round<br>6499 to the<br>nearest<br>1000 | Round<br>7500 to the<br>nearest<br>1000 | Round<br>351 to the<br>nearest<br>100 | Round<br>34 to the<br>nearest<br>10 | Round<br>3 to the<br>nearest<br>10 |
|--------|---------------------------------------|--------------------------------------|-----------------------------------------|-----------------------------------------|---------------------------------------|-------------------------------------|------------------------------------|
| Answer |                                       |                                      |                                         |                                         |                                       |                                     |                                    |
| Letter |                                       |                                      |                                         |                                         |                                       |                                     |                                    |

Round these numbers to the nearest:

| <u><b>10</b></u> |
|------------------|
| 1) 873           |
| 2) 1390          |
| 3) 1772          |
| 4) 1428          |
| 5) 1,016,428     |
| 6) 18, 1364      |
| 7) 3045          |
| 8) 3, 867,909    |

| <u><b>100</b></u> |
|-------------------|
| 9) 19, 592        |
| 10) 62, 747       |
| 11) 20, 800       |
| 12) 76, 407       |
| 13) 9068          |
| 14) 4438          |
| 15) 42, 155       |
| 16) 79, 939       |

| <u><b>1000</b></u> |
|--------------------|
| 17) 25, 236        |
| 18) 23, 589        |
| 19) 78, 376        |
| 20) 29, 500        |
| 21) 35, 5209       |
| 22) 1, 457, 789    |
| 23) 2, 456, 109    |
| 24) 7, 509, 999    |

## Approximate decimals by rounding to a whole number, 1 or 2 decimal places

| Draw a line to match the decimals to the nearest 1 or 2 decimal places |  |       |
|------------------------------------------------------------------------|--|-------|
| 1.4598                                                                 |  | 9.79  |
| 9.7854                                                                 |  | 1.45  |
| 9.75328                                                                |  | 1.46  |
| 1.45489                                                                |  | 9.7   |
| 17.8949                                                                |  | 17.89 |
| 17.9499                                                                |  | 17.9  |

3 athletes are competing in an athletics event. The winner is recorded by rounding each time or distance to the nearest whole number.

Find the winner in each round

| Javelin |        | Rounded | Long jump |      | Rounded |        | 200m race | Rounded |
|---------|--------|---------|-----------|------|---------|--------|-----------|---------|
| Paul    | 14.8m  |         | Paul      | 7.4m |         | Paul   | 35.8s     |         |
| John    | 15.51m |         | John      | 8.1m |         | John   | 35.4s     |         |
| Mo      | 14.4m  |         | Mo        | 9.3m |         | Mo     | 36.62s    |         |
| Winner: |        |         | Winner    |      |         | Winner |           |         |

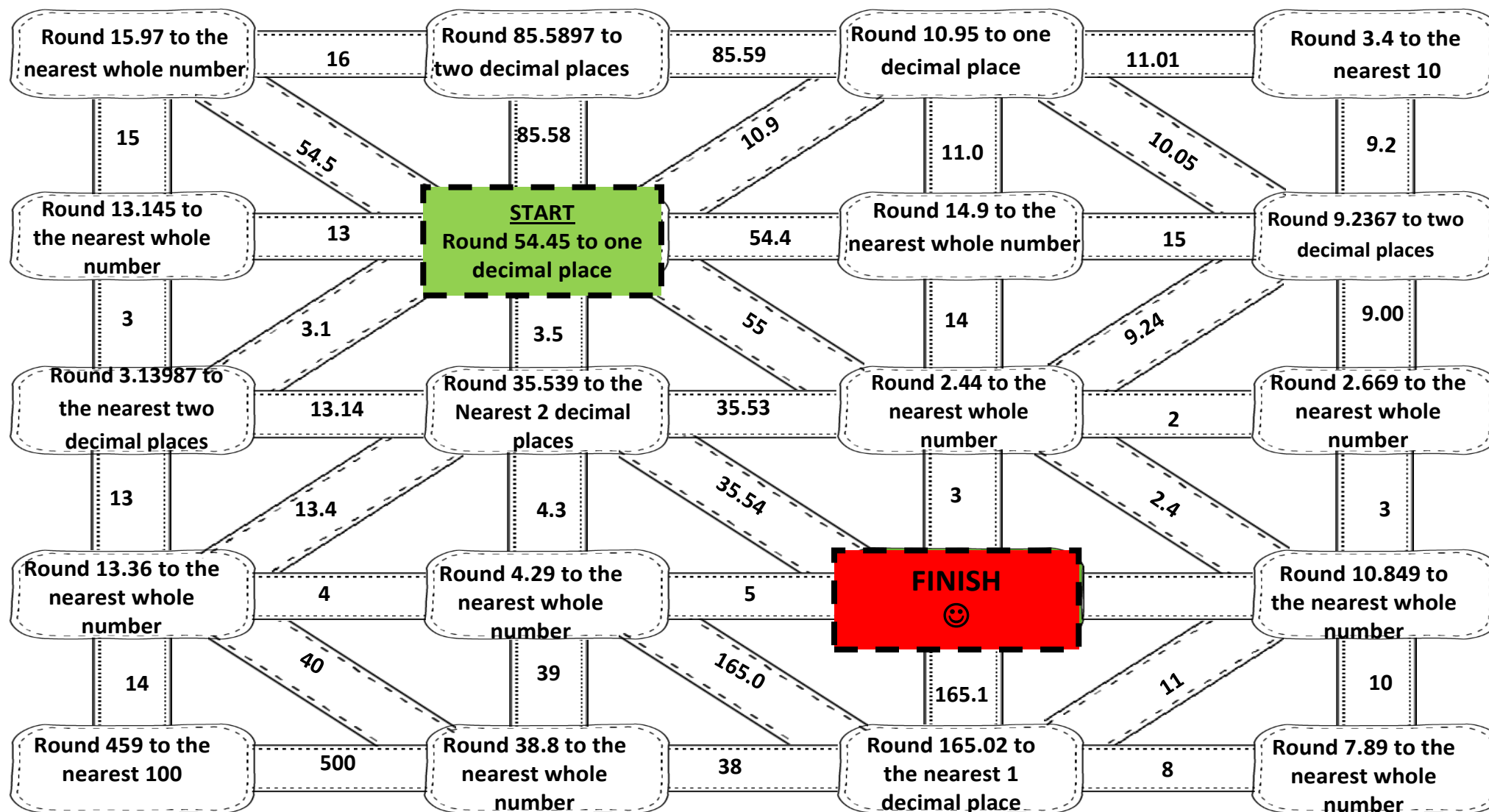
| High jump |          | Rounded |        | 100m race | Rounded |
|-----------|----------|---------|--------|-----------|---------|
| Paul      | 178.6cm  |         | Paul   | 15.49s    |         |
| John      | 128.2cm  |         | John   | 15.01s    |         |
| Mo        | 178.49cm |         | Mo     | 15.52s    |         |
| Winner    |          |         | Winner |           |         |



The overall winner of the gold medal is the person who has won the most rounds.

Who wins the medal?

Answer the question on the start square. The answer will be in one of the pathways attached to it.! Work your way around the maze until you get to the end.



### Add using three digit whole numbers

|                                                                 |                                                                 |                                                                 |                                                                 |
|-----------------------------------------------------------------|-----------------------------------------------------------------|-----------------------------------------------------------------|-----------------------------------------------------------------|
| $\begin{array}{r} 323 \\ + 518 \\ \hline \\ \hline \end{array}$ | $\begin{array}{r} 607 \\ + 228 \\ \hline \\ \hline \end{array}$ | $\begin{array}{r} 507 \\ + 463 \\ \hline \\ \hline \end{array}$ | $\begin{array}{r} 319 \\ + 142 \\ \hline \\ \hline \end{array}$ |
| $\begin{array}{r} 257 \\ + 706 \\ \hline \\ \hline \end{array}$ | $\begin{array}{r} 505 \\ + 109 \\ \hline \\ \hline \end{array}$ | $\begin{array}{r} 672 \\ + 243 \\ \hline \\ \hline \end{array}$ | $\begin{array}{r} 591 \\ + 367 \\ \hline \\ \hline \end{array}$ |
| $\begin{array}{r} 572 \\ + 336 \\ \hline \\ \hline \end{array}$ | $\begin{array}{r} 760 \\ + 615 \\ \hline \\ \hline \end{array}$ | $\begin{array}{r} 822 \\ + 345 \\ \hline \\ \hline \end{array}$ | $\begin{array}{r} 912 \\ + 461 \\ \hline \\ \hline \end{array}$ |

#### Word problems

- 1) There are 111 pencils in the drawer. Tim placed 130 more pencils in the drawer. How many pencils are now there in total?
- 2) Benny picked 118 oranges and Fred picked 109 oranges. Mary picked 134 pears. How many oranges were picked in total?
- 3) Nancy and her children were collecting seashells, Nancy found 649 seashells. She gave Tom 496 of the seashells. Mary collected 235 shells and Rob collected 123. How many seashells were collected altogether?
- 4) Mary had £723 in her bank. Her wages of £449 got paid in. How much does she have now?
- 5) Keith had 697 baseball cards, and 6 were torn. Alyssa gave Keith 486 of Keith's baseball cards. How many baseball cards does Keith have now?



# Subtract using three digit whole numbers

|                                                                 |                                                                 |                                                                 |                                                                 |
|-----------------------------------------------------------------|-----------------------------------------------------------------|-----------------------------------------------------------------|-----------------------------------------------------------------|
| $\begin{array}{r} 451 \\ - 218 \\ \hline \\ \hline \end{array}$ | $\begin{array}{r} 840 \\ - 525 \\ \hline \\ \hline \end{array}$ | $\begin{array}{r} 472 \\ - 238 \\ \hline \\ \hline \end{array}$ | $\begin{array}{r} 481 \\ - 323 \\ \hline \\ \hline \end{array}$ |
| $\begin{array}{r} 690 \\ - 526 \\ \hline \\ \hline \end{array}$ | $\begin{array}{r} 726 \\ - 419 \\ \hline \\ \hline \end{array}$ | $\begin{array}{r} 427 \\ - 233 \\ \hline \\ \hline \end{array}$ | $\begin{array}{r} 519 \\ - 450 \\ \hline \\ \hline \end{array}$ |
| $\begin{array}{r} 353 \\ - 136 \\ \hline \\ \hline \end{array}$ | $\begin{array}{r} 627 \\ - 258 \\ \hline \\ \hline \end{array}$ | $\begin{array}{r} 622 \\ - 394 \\ \hline \\ \hline \end{array}$ | $\begin{array}{r} 951 \\ - 652 \\ \hline \\ \hline \end{array}$ |

## Challenge

|                                                                         |                                                                         |                                                                         |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------|
| $\begin{array}{r} 5\_8 \\ + \_3\_ \\ \hline 1487 \\ \hline \end{array}$ | $\begin{array}{r} 641 \\ + \_7\_ \\ \hline 12\_4 \\ \hline \end{array}$ | $\begin{array}{r} 4\_5 \\ + 878 \\ \hline 1\_5\_ \\ \hline \end{array}$ |
| $\begin{array}{r} 34\_ \\ - 2\_4 \\ \hline \_33 \\ \hline \end{array}$  | $\begin{array}{r} \_48 \\ - 30\_ \\ \hline 2\_6 \\ \hline \end{array}$  | $\begin{array}{r} 7\_4 \\ - \_60 \\ \hline 43\_ \\ \hline \end{array}$  |

Add and subtract negative numbers

Use the rules of negative numbers to solve the code:

|    |    |    |    |    |    |    |    |   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|---|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|
| a  | b  | c  | d  | e  | f  | g  | h  | i | j | k | l | m | n | o | p | q | r | s  | t  | u  | v  | w  | x  | y  | z  |
| -8 | -7 | -6 | -5 | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |

|        |        |       |         |         |         |       |       |       |        |       |       |        |
|--------|--------|-------|---------|---------|---------|-------|-------|-------|--------|-------|-------|--------|
| Sum    | -2 + 5 | 4 - 8 | -3 + 13 | -2 x -5 | -6 + 17 | 6 - 7 | -2- 6 | -1 +6 | 10 + 7 | -1 -3 | 0 + 9 | -6 +12 |
| Answer |        |       |         |         |         |       |       |       |        |       |       |        |
| Letter |        |       |         |         |         |       |       |       |        |       |       |        |

What is a negative number?

..... / ..... / .....

### Add and subtract negative numbers

a) *The temperature on Tuesday is  $5^{\circ}\text{C}$ . On Wednesday it is 6 degrees colder. What is the temperature on Wednesday?*

b) *The temperature on Friday is  $-7^{\circ}\text{C}$ . The following the day, the temperature rises by 9 degrees. What is the temperature the following day?*

c) *The temperature in London is  $-5^{\circ}\text{C}$ . In Birmingham it is  $-8^{\circ}\text{C}$ . What is the difference between the 2 temperatures?*

d) *What is 7 minus 11?*

e) *How many degrees more is  $2^{\circ}\text{C}$  than  $-2^{\circ}\text{C}$ ?*

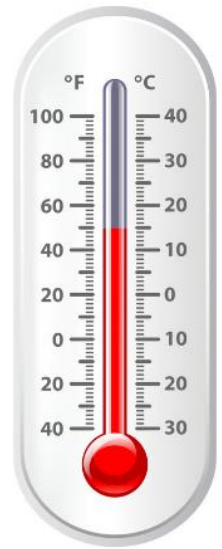
f) *Increase -3 by 6.*

g) *What is 3 minus 10?*

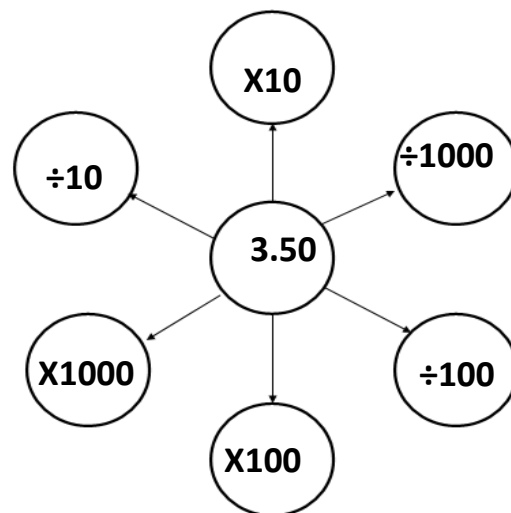
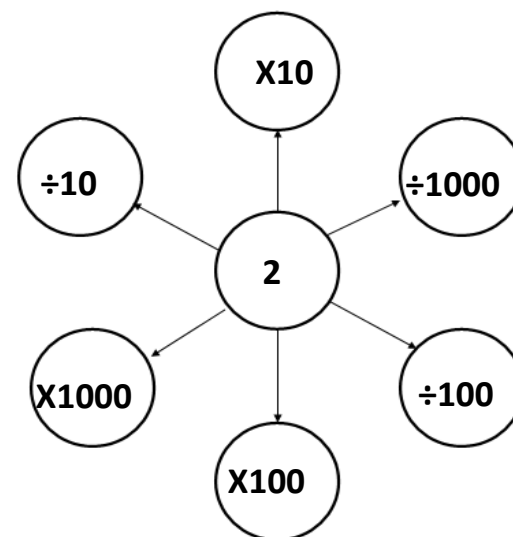
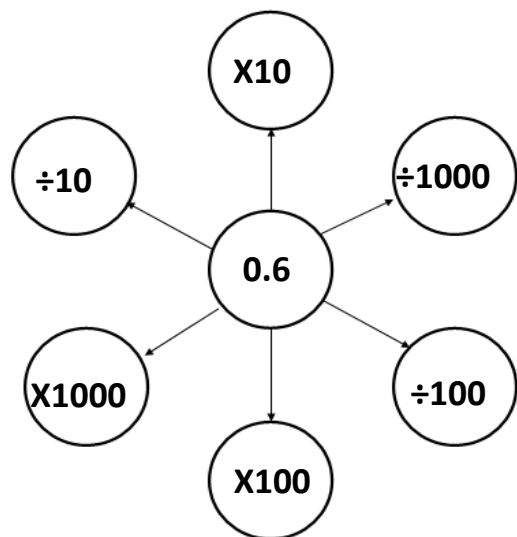
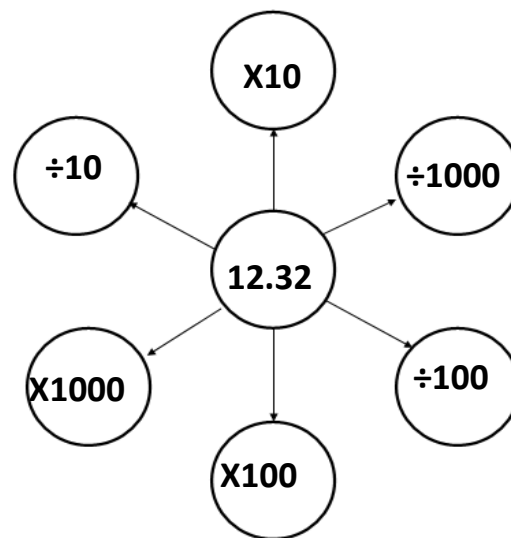
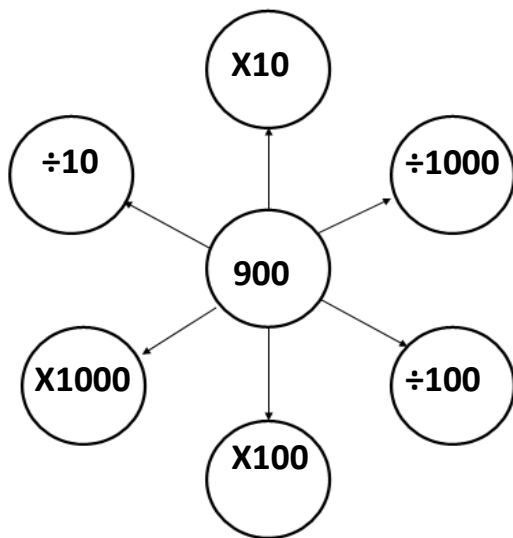
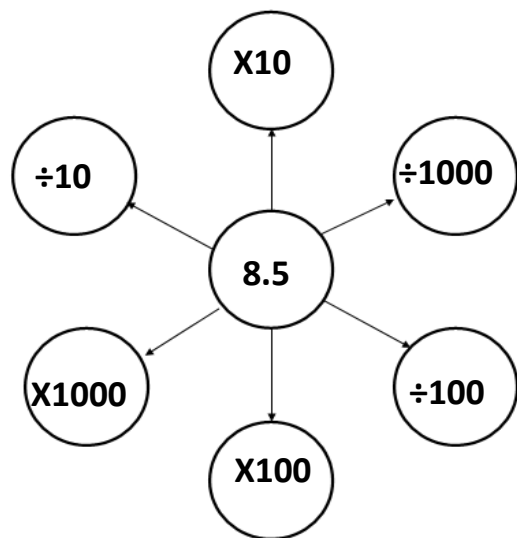
h) *The temperature on Sunday is  $4^{\circ}\text{C}$ . The following day it drops by  $11^{\circ}\text{C}$ . What is the temperature on the following day?*

i) *The temperature is  $-9^{\circ}\text{C}$ . If it is  $8^{\circ}\text{C}$  warmer on the following day, what will the temperature be?*

j) *The temperature is  $-6^{\circ}\text{C}$ . The following day it is 9 degrees warmer. What is the temperature on the following day?*



## Multiply and divide whole numbers and decimals by 10, 100, 1000



**Multiply and divide whole numbers and decimals by 10, 100, 1000**

| Complete the table  |  |
|---------------------|--|
| $123 \times 10$     |  |
| $14.8 \times 100$   |  |
| $456.983 \times 10$ |  |
| $8.93 \times 100$   |  |
| $1.983 \times 10$   |  |
| $0.1983 \times 100$ |  |
| $0.1457 \times 10$  |  |
| $230 \div 10$       |  |
| $1873 \div 10$      |  |
| $1678 \div 100$     |  |
| $62.3 \div 10$      |  |
| $345 \div 100$      |  |
| $2.35 \div 10$      |  |
| $123.56 \div 100$   |  |

Multiply 2 digit whole numbers by single and 2 digit whole numbers

$$\begin{array}{r} 14 \\ \times 39 \\ \hline \end{array}$$

$$\begin{array}{r} 32 \\ \times 23 \\ \hline \end{array}$$

$$\begin{array}{r} 1 \\ \times 70 \\ \hline \end{array}$$

$$\begin{array}{r} 78 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 17 \\ \times 60 \\ \hline \end{array}$$

$$\begin{array}{r} 68 \\ \times 47 \\ \hline \end{array}$$

$$\begin{array}{r} 41 \\ \times 51 \\ \hline \end{array}$$

$$\begin{array}{r} 59 \\ \times 1 \\ \hline \end{array}$$

$$\begin{array}{r} 45 \\ \times 84 \\ \hline \end{array}$$

$$\begin{array}{r} 54 \\ \times 22 \\ \hline \end{array}$$

$$\begin{array}{r} 86 \\ \times 96 \\ \hline \end{array}$$

$$\begin{array}{r} 34 \\ \times 54 \\ \hline \end{array}$$

## Calculate square numbers

Square the following numbers:

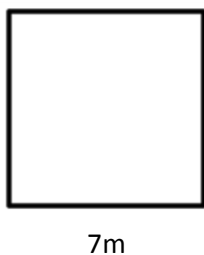
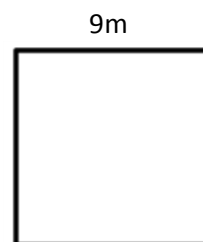
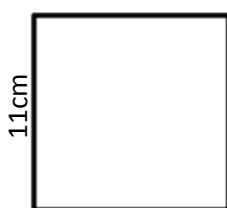
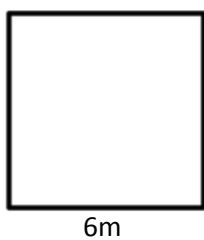
- 1) 2
- 2) 11
- 3) 4
- 4) 8
- 5) 7
- 6) 12
- 7) 9
- 8) 7
- 9) 6
- 10) 30

Finding the square root

Which numbers multiplied by themselves give the following answers?

- 1) 1
- 2) 4
- 3) 9
- 4) 100
- 5) 25
- 6) 121
- 7) 36
- 8) 64
- 9) 144

Find the area of the following square



## Divide 3 digit whole numbers by single and double digit whole numbers

Is the Number to the left of each row divisible by the Number at top of each column?

Write Y (YES) or N (NO) in each box.

|     | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|-----|---|---|---|---|---|---|---|---|----|----|----|
| 308 |   |   |   |   |   |   |   |   |    |    |    |
| 596 |   |   |   |   |   |   |   |   |    |    |    |
| 164 |   |   |   |   |   |   |   |   |    |    |    |
| 730 |   |   |   |   |   |   |   |   |    |    |    |
| 570 |   |   |   |   |   |   |   |   |    |    |    |
| 140 |   |   |   |   |   |   |   |   |    |    |    |

Space for working



## Use Bodmas to solve problems

### Introduction to the murder

Ant and Dec couldn't believe what they had discovered! The secret they had just learnt about a certain celebrity's private life was unbelievable. They just had to make it public knowledge – it was just too juicy to keep to themselves.

They confronted the celeb but were warned to keep their big mouths shut!

But the celebrity decided they couldn't take any chances... Later that week, Ant and Dec were found poisoned in their dressing room.

When police arrived on the scene, they found 6 celebrities lurking around, but who is the guilty one?

### Clue 1: Does their alibi check out?

All the suspects have an alibi. They claim they were teaching children how to use BODMAS. Ned gave each suspect a sum to solve.

Find out who used BODMAS correctly, to see who is telling the truth. The person telling the truth is not the murderer.

|                       |                     | Correct answer |
|-----------------------|---------------------|----------------|
| $7+2\times4$          | Emma's answer: 36   |                |
| $5\times4\div2$       | David's answer: 8   |                |
| $2\times6\div3$       | Mel's answer: 12    |                |
| $6-2\times2$          | Louis' answer: 8    |                |
| $(5\times5)-4\times5$ | Gary's answer: 5    |                |
| $23-7\times4\div2$    | Amanda's answer: 32 |                |

### **Clue 2: Weapon of choice**

It is clear that Ant and Dec were poisoned somehow.

Which one of the celebrities doesn't have any toxins in their dressing room?

Solve the sums to see how many toxins the celebrities have in their dressing rooms.

|        |                               |  |
|--------|-------------------------------|--|
| Simon  | $7 \div (10 + 3 - 6)$         |  |
| David  | $(4 + 1 + 4) \div 3$          |  |
| Mel    | $9 \div 9 \times (8 + 7)$     |  |
| Louis  | $0 \div 5 \times 3 \times 3$  |  |
| Gary   | $8 + 3 \div 3 + 9$            |  |
| Amanda | $10 \div 5 \times 3 \times 3$ |  |

### **Clue 3: It's all in the blood**

A drop of blood was found at the scene which was found to be blood type O.

Only one of the suspects does not have this blood type.

Blood type O is defined to have either a 3 or a 4 or both in the genetic coding.

Find which of these solutions does not contain a 3 or a 4 to eliminate a suspect.

|        |                            |  |
|--------|----------------------------|--|
| Simon  | $15 - 3 \times 4$          |  |
| David  | $20 \div (10 \div 2)$      |  |
| Mel    | $4 - 4 + 3 \times 11$      |  |
| Louis  | $2 \times 25 - 2 \times 3$ |  |
| Gary   | $4 + 5 \times 6$           |  |
| Amanda | $24 - (6 \times 2)$        |  |

#### **Clue 4: If the boot fits**

The detectives found a mysterious footprint around Ant and Dec's drinks cabinet. The print seemed to be between 10 and 11 inches long.

Solve these equations to find out whose feet aren't the right size.

|        |                                  |  |
|--------|----------------------------------|--|
| Simon  | $0 \times 10 + 10$               |  |
| David  | $(5 - 5 + 7 \times 3) \div 2$    |  |
| Mel    | $(30 - 3) \div (6 \div 2)$       |  |
| Louis  | $(77 + 11) \div 8$               |  |
| Gary   | $(0 \div 5) + 51 \div 5$         |  |
| Amanda | $((5 \times 2) \times 2) \div 2$ |  |

#### **Clue 5: Phone calls**

The murderer must have called the TV duo a lot over the past week to try and convince them to keep quiet – so we'll eliminate the person who phoned them the least amount of times.

Solve these equations to find out how many phone calls they each made.

|        |                           |  |
|--------|---------------------------|--|
| Simon  | $(10 \div 2 - 3)^2$       |  |
| David  | $8 \times (8 - 8) \div 9$ |  |
| Mel    | $4 + 10 - (5 + 7)$        |  |
| Louis  | $9 + (6 \div 6)^9$        |  |
| Gary   | $3^2 + 4 \div 2$          |  |
| Amanda | $(5 - 8 \div 8) \times 4$ |  |

**Extension: Why?**

Solve each of the questions. Look for your answer in the grid below. Cross out each box containing a correct solution. When you have finished there will be 15 boxes left. Write the letters in those boxes in order from right to left.

$$3 \times (5^2 - 4^2)$$

$$(7 + 1)^2 + (10 - 6)^2$$

$$9^2 + 4^2 + (4 \div 2)^2 - 1$$

$$2 + (4 + 3)^2$$

$$(6 + 2)^2 - 1$$

$$4^3 \div 8$$

$$36 \div (6 \div 2)^2$$

|                 |                 |                  |                 |                  |
|-----------------|-----------------|------------------|-----------------|------------------|
| <b>AN</b><br>27 | <b>ER</b><br>81 | <b>IC</b><br>12  | <b>RS</b><br>51 | <b>ST</b><br>63  |
| <b>IS</b>       | <b>AI</b><br>8  | <b>NO</b><br>101 | <b>TH</b><br>9  | <b>RS</b><br>100 |
| <b>IS</b><br>7  | <b>ON</b><br>4  | <b>RM</b><br>80  | <b>SO</b><br>28 | <b>NI</b><br>10  |

### Add and subtract decimals up to 2 decimal places

1)  $£2.35 + £1.40$

2)  $£16.35 - £3.45$

3)  $£102.70 + £23.56$

4)  $£28.53 - £3.55$

5)  $£28.53 + £3.55 + £7.00$

6) Katie goes to Kwik Save and buys Sausages for £1.39, Cheese for £2.50 and Apples for £1.27. How much did she spend?

7) The council spends £6.9 million on schools. Their whole budget is £70.6 million. How much is left for other things?

8) Kayleigh runs 100 metres in 13.7 seconds. Helen runs it in 12.9 seconds. How much faster is Helen?

9) Yasmin is fitting a skirting board in her bedroom. The walls measure 3 metres, 1.6 metres, 1.75 metres, 3 metres, 0.95 metres and 0.85 metres. How much skirting board will she need?

## Multiply and divide decimals up to 2 decimal places

- 1) Dave went to buy Christmas cards. He got 7 packs at £3.15 each. How much did he spend?
- 2) Chris is building a fitted kitchen. He needs 5 units measuring 52.5 cm and 3 units measuring 76.25 cm. How much does this come to altogether?
- 3) Mark makes 9 local phone calls on Saturday. Each one costs 4.3p a minute. How much did they cost altogether?
- 4) Patrick works in a restaurant. He has to make 5 strawberry and cream gateaux. He has 2.25 kg of strawberries and 1.95 litres of cream altogether. How much will he put on each gateau?
- 5) Yasmin has a piece of wood measuring 1.72 metres. She wants to put 2 shelves in her hall. How long will each shelf be?

1)  $6 \overline{) 2.1}$

2)  $4 \overline{) 2.3}$

3)  $2 \overline{) 52.1}$

4)  $6 \overline{) 13.23}$

## Dividing decimals mystery



Work out each division and then find it in the table of answers. Write the letter of the sum in the box above the answer.

(I)  $120 \div 100$

(E)  $4.2 \div 3$

(H)  $9.9 \div 3$

(L)  $27 \div 30$

(O)  $19.5 \div 3$

(N)  $7.5 \div 1.5$

(T)  $65 \div 50$

(K)  $87 \div 10$

(B)  $3.6 \div 0.9$

(R)  $1633 \div 1000$

(E)  $9 \div 6$

(R)  $14 \div 4$

(E)  $5.34 \div 5.34$

(S)  $666 \div 200$

(L)  $16.5 \div 2$

(A)  $21 \div 30$

(K)  $7200 \div 900$

(S)  $13.5 \div 3$

(H)  $200 \div 1000$

(E)  $490 \div 70$

(W)  $402 \div 300$

(K)  $22 \div 4$

(C)  $171 \div 17.1$

(O)  $396 \div 400$

(S)  $214.8 \div 4$

(O)  $2.28 \div 1.14$

(L)  $4.8 \div 3$

(A)  $45 \div 6$

(G)  $14.32 \div 3$

(R)  $17.6 \div 2$

(E)  $420 \div 70$

(D)  $17.66 \div 2$

(N)  $96.8 \div 2$

(S)  $4 \div 1.6$

(E)  $2.7 \div 0.9$

(C)  $0.27 \div 0.03$

|     |     |   |     |     |     |     |     |     |      |      |       |     |   |      |     |    |   |
|-----|-----|---|-----|-----|-----|-----|-----|-----|------|------|-------|-----|---|------|-----|----|---|
|     |     |   |     |     |     |     |     |     |      |      |       |     |   |      |     |    |   |
| 1.3 | 3.3 | 1 | 8.7 | 1.2 | 0.9 | 1.6 | 1.5 | 3.5 | 1.34 | 1.98 | 1.633 | 1.4 | 4 | 8.25 | 0.7 | 10 | 8 |

|     |     |     |   |      |     |   |      |      |     |   |   |      |     |   |   |     |      |
|-----|-----|-----|---|------|-----|---|------|------|-----|---|---|------|-----|---|---|-----|------|
|     |     |     |   |      |     |   |      |      |     |   |   |      |     |   |   |     |      |
| 4.5 | 0.2 | 6.5 | 7 | 53.7 | 7.5 | 5 | 8.83 | 4.84 | 8.8 | 6 | 3 | 48.4 | 2.5 | 2 | 9 | 5.5 | 3.33 |

Simplify fractions to find equivalent forms

1 )  $\frac{63}{81} =$  \_\_\_\_\_

2 )  $\frac{8}{16} =$  \_\_\_\_\_

3 )  $\frac{7}{14} =$  \_\_\_\_\_

4 )  $\frac{14}{16} =$  \_\_\_\_\_

5 )  $\frac{40}{48} =$  \_\_\_\_\_

6 )  $\frac{24}{30} =$  \_\_\_\_\_

7 )  $\frac{42}{49} =$  \_\_\_\_\_

8 )  $\frac{10}{30} =$  \_\_\_\_\_

9 )  $\frac{7}{28} =$  \_\_\_\_\_

10 )  $\frac{4}{20} =$  \_\_\_\_\_

11 )  $\frac{40}{44} =$  \_\_\_\_\_

12 )  $\frac{88}{96} =$  \_\_\_\_\_

13 )  $\frac{10}{90} =$  \_\_\_\_\_

14 )  $\frac{10}{15} =$  \_\_\_\_\_

15 )  $\frac{18}{30} =$  \_\_\_\_\_

16 )  $\frac{18}{42} =$  \_\_\_\_\_

17 )  $\frac{32}{80} =$  \_\_\_\_\_

18 )  $\frac{7}{28} =$  \_\_\_\_\_

19 )  $\frac{40}{60} =$  \_\_\_\_\_

20 )  $\frac{6}{48} =$  \_\_\_\_\_



**Find parts of whole number quantities or measurements, e.g.  $\frac{2}{3}$  or  $\frac{3}{4}$**

- 1) What is  $\frac{3}{4}$  of 500?
- 2) What is  $\frac{2}{3}$  of 600?
- 3) What is  $\frac{4}{5}$  of 9005?
- 4) What is  $\frac{6}{8}$  of £200?
- 5) What is  $\frac{2}{5}$  of £500?

1) You go for a meal with 5 friends the meal costs £74. You have a voucher for  $\frac{1}{3}$  off. How much is the discount?

1 b) How much does the meal cost now?

2) You book a holiday which costs £3000. You check the price a week later and it has gone up by  $\frac{1}{8}$  how much has the price increased by?

2b) How much does the holiday cost now?

3) Lucy has a bag of 6 counters. 5 of them are red. The rest are blue. What fractions are blue?

4) Sarah calculates that she spends  $\frac{1}{3}$  of her pocket money on sweets, and  $\frac{2}{5}$  on magazines. What fraction of her pocket money does Sarah spend on sweets and magazines?

### Convert mixed fractions

1) Convert the following to mixed numbers:

a)  $\frac{11}{6}$

b)  $\frac{12}{8}$

c)  $\frac{16}{7}$

d)  $\frac{43}{4}$

2) Convert the following into an improper fraction:

a)  $4\frac{3}{5}$

b)  $3\frac{2}{9}$

c)  $6\frac{5}{6}$

d)  $9\frac{6}{7}$

### Adding and Subtracting Fractions Codebreaker

| A               | B               | C               | D              | E               | F              | G               | H               | I               | J               | K               | L               | M               |
|-----------------|-----------------|-----------------|----------------|-----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| $\frac{31}{40}$ | $\frac{19}{24}$ | $\frac{20}{21}$ | $\frac{1}{10}$ | $\frac{23}{24}$ | $\frac{5}{12}$ | $\frac{19}{21}$ | $\frac{33}{40}$ | $\frac{3}{4}$   | $\frac{19}{30}$ | $\frac{3}{20}$  | $\frac{19}{36}$ | $\frac{17}{30}$ |
| N               | O               | P               | Q              | R               | S              | T               | U               | V               | W               | X               | Y               | Z               |
| $\frac{11}{24}$ | $\frac{9}{20}$  | $\frac{13}{18}$ | $\frac{7}{15}$ | $\frac{8}{15}$  | $\frac{7}{12}$ | $\frac{7}{9}$   | $\frac{7}{20}$  | $\frac{11}{18}$ | $\frac{3}{10}$  | $\frac{11}{30}$ | $\frac{1}{20}$  | $\frac{17}{24}$ |

Calculate the answers to the fraction problems below giving your answers in their simplest form, link your answers to the table above to reveal:

Why the worst type of crime is in multi-storey car parks?

|                   |                             |                             |                    |                              |                               |                             |                             |
|-------------------|-----------------------------|-----------------------------|--------------------|------------------------------|-------------------------------|-----------------------------|-----------------------------|
| $1 - \frac{1}{4}$ | $\frac{5}{9} + \frac{2}{9}$ | $\frac{1}{2} + \frac{1}{4}$ | $1 - \frac{5}{12}$ | $\frac{1}{5} + \frac{1}{10}$ | $\frac{11}{15} - \frac{1}{5}$ | $\frac{1}{5} + \frac{1}{4}$ | $\frac{1}{8} + \frac{1}{3}$ |
|                   |                             |                             |                    |                              |                               |                             |                             |
|                   |                             |                             |                    |                              |                               |                             |                             |

|                             |                              |                             |                             |                             |                              |                             |                             |
|-----------------------------|------------------------------|-----------------------------|-----------------------------|-----------------------------|------------------------------|-----------------------------|-----------------------------|
| $\frac{4}{7} + \frac{1}{3}$ | $\frac{3}{4} - \frac{3}{10}$ | $\frac{5}{6} - \frac{3}{8}$ | $\frac{2}{5} + \frac{1}{6}$ | $\frac{2}{5} + \frac{3}{8}$ | $\frac{1}{12} + \frac{3}{8}$ | $\frac{4}{5} - \frac{3}{4}$ | $\frac{3}{4} - \frac{2}{9}$ |
|                             |                              |                             |                             |                             |                              |                             |                             |
|                             |                              |                             |                             |                             |                              |                             |                             |

|                             |                             |                             |                                |                             |
|-----------------------------|-----------------------------|-----------------------------|--------------------------------|-----------------------------|
| $\frac{5}{6} + \frac{1}{8}$ | $\frac{5}{6} - \frac{2}{9}$ | $\frac{1}{3} + \frac{5}{8}$ | $\frac{17}{18} - \frac{5}{12}$ | $\frac{1}{3} + \frac{1}{4}$ |
|                             |                             |                             |                                |                             |
|                             |                             |                             |                                |                             |

**Recognise and calculate equivalences between common fractions,  
percentages and decimals**

Fill in the blank spaces in the table below so that each of the values along the row shows the equivalent amount.

| <b>FRACTIONS</b> | <b>DECIMALS</b> | <b>PERCENTAGES</b> |
|------------------|-----------------|--------------------|
| $\frac{1}{4}$    |                 |                    |
|                  | <b>0.35</b>     |                    |
|                  |                 | <b>15%</b>         |
| $\frac{3}{4}$    |                 |                    |
|                  | <b>0.50</b>     |                    |
|                  |                 | <b>22%</b>         |
| $\frac{5}{8}$    |                 |                    |
|                  | <b>0.02</b>     |                    |
| $\frac{2}{5}$    |                 |                    |
|                  |                 | <b>120%</b>        |

Space for working

## **Calculate percentages of amounts and simple percentage increase and decrease**

1. Carol receives £5 pocket money. How much pocket money does she get if she receives an increase of 15%?

2. A man on a weekly wage of £210 receives an increase of 3.5%. A woman on a weekly wage of £142 receives an increase of 5%. Who receives the highest increase and what is the difference?

3. A museum gives a discount of 10% of the normal price to everyone who has a season ticket. How much does a person with a season ticket pay for a book which costs £9.90?

4. A shop bought a camera for £214 and sold it making a profit of 32%. Find out the selling price of the camera.

5. The price of a computer without VAT is £996. What is the price of the computer including VAT at 20%?

6. A car tyre costs £22.50 without VAT. How much will 4 tyres cost including VAT at 17.5%?

7. 95% of the school's children are present today. If there are 640 children on the school register, how many children are present? How many children are absent?

### Calculate direct proportion

1. A florist feeds her flowers with 6 drops of fertilizer to every 400ml of water. How many drops of fertilizer are needed for 1.8 litres of water?

2. Blackcurrant squash is sold in the interval. The instructions on the bottle state 'for squash, mix one part concentrate with three parts water.'  
How much concentrate is used to make 3 litres of squash?

3. A committee member makes scones for the refreshment stall.  
These are the ingredients from the recipe she uses.

225g self-raising flour

40g butter

150ml milk

5ml baking powder

1 pinch of salt

**These ingredients will make 8 scones**

She buys ingredients for 144 scones. How many 250g packs of butter does she buy?

4. A builder makes a concrete mix for an extension. He uses 3 litres of water with every 25 kilograms of dry concrete materials.

To the nearest litre, how much water does the builder add to 160 kilograms of dry concrete materials.

### Calculate mean and range

1) Find the mean and range of the list of number below.

280, 350, 320, 400, 350, 490, 590, 470, 280, 410

2) Below is a list of recorded reaction times in seconds.

0.25, 0.34, 0.39, 0.38, 0.39, 1.67, 0.28, 0.30, 0.42, 0.67

Calculate the mean reaction time

3) John rolled a dice 5 times here are the numbers he rolled: 3 2 4 6 3

What is the mean of these numbers?

4) Kelsey is a doctor she wants to know what the average weight of 6 of her patients is.

Here are the weights, in kg, 59 62, 58, 65, 58, 58

What is the mean of these weights?

5) Here are the ages of 6 people.

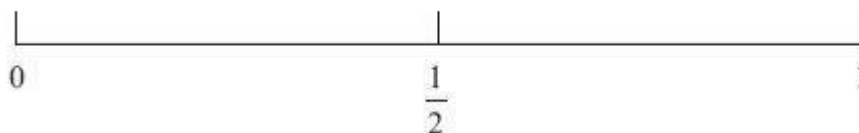
5 18 10 14 22 12

(a) Work out the range and the mean of these ages.

## Express the likelihood of an event using fractions, and on a scale of 0 to 1

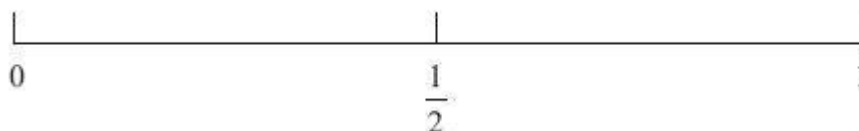
Liam throws a fair coin once.

1. On the probability scale below, mark with a cross (×) the probability that he gets a head.



2. Ann rolls a fair dice once.

On the probability scale below, mark with a cross (×) the probability that she gets a 7



|        |            |         |       |          |
|--------|------------|---------|-------|----------|
| likely | impossible | certain | evens | unlikely |
|--------|------------|---------|-------|----------|

3. Use a word from the box which best describes the probability of each of the following events.

- (a) When you throw an ordinary coin you get a tail.

.....

- (b) When you throw an ordinary dice you get a number less than 7

.....

- (c) Christmas day will fall on the 25<sup>th</sup> December this year

.....



## Calculate area and perimeter and volume

Work out the area and perimeter of the shapes below:

1)

3m



5m

2)

2.4m



3.2m

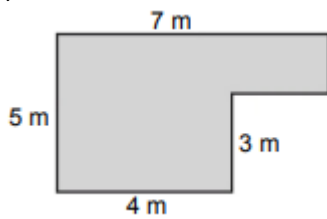
3)

5.2m

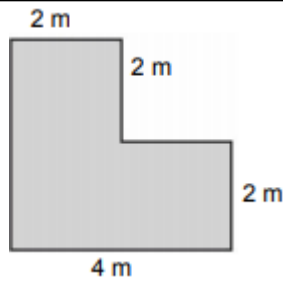


5.2m

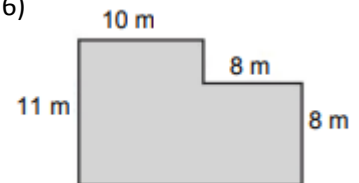
4)



5)

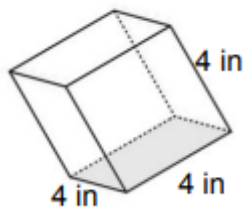


6)

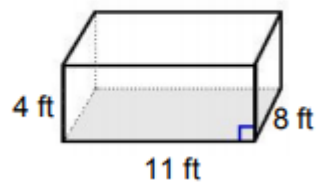


Calculate the volumes of the shapes below

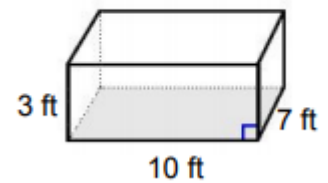
7)



8)



9)

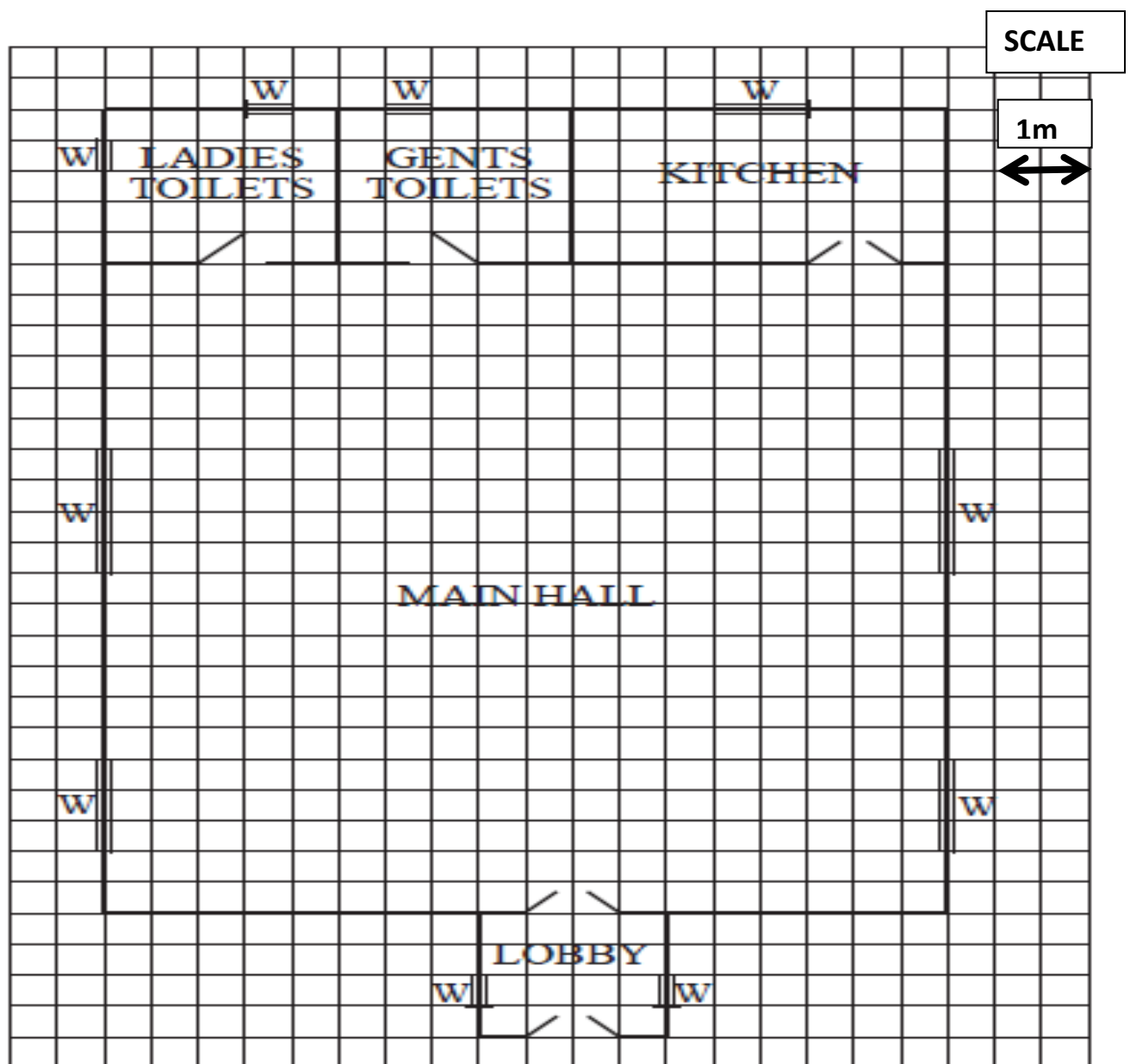


## Recognise and make use of simple scales on maps and Scale drawings

The diagram below shows the plan of a village hall

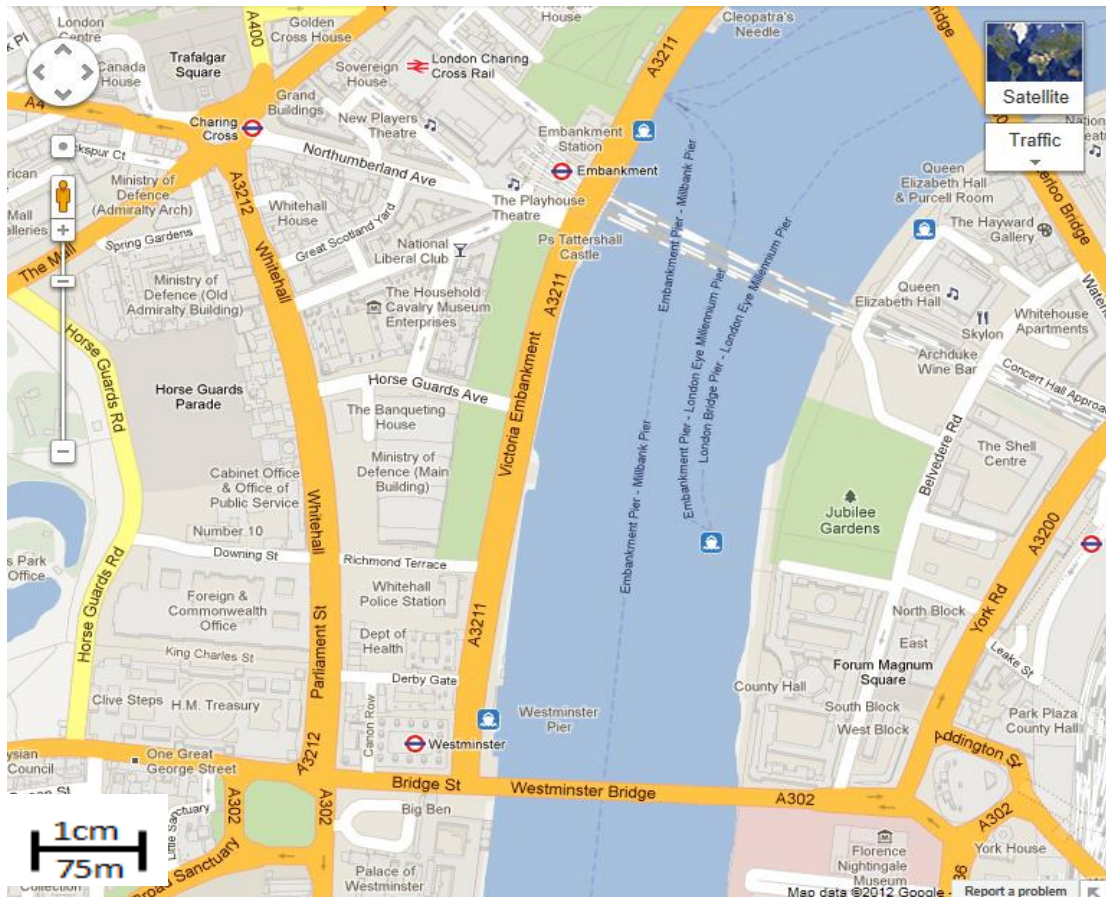
Use the given scale to work out the real life measurements of the following?

- a) The dimensions of the kitchen?
- b) The area of the lobby?
- c) The length of the kitchen window?



## Recognise and make use of simple scales on maps and drawings

The map below zooms in on the area of Westminster use a ruler to answer the questions below

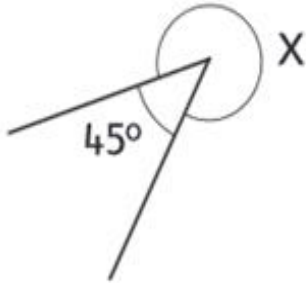


1. The Houses of Parliament is shown by its proper name of the Palace of Westminster on this map. How far does the Prime Minister have to travel to get from 10 Downing Street to Parliament?
2. Horse Guards Parade will be the venue of the Beach Volleyball at this summer's Olympic Games. How far is it from Charing Cross station?
3. How long is Westminster Bridge?
4. What is the perimeter and area of Jubilee Gardens?

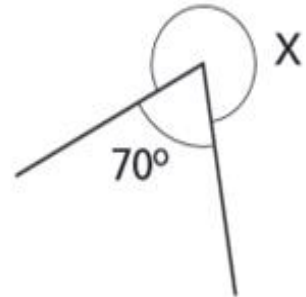
## Calculate angles

Calculate the missing angles. Diagrams are not drawn accurately.

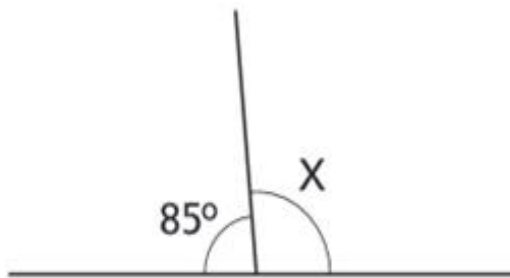
1)



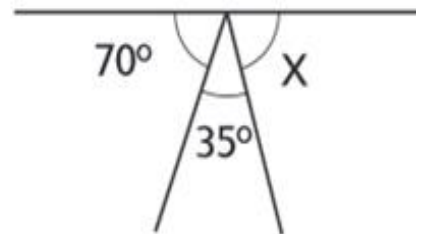
2)



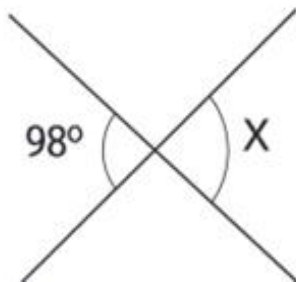
3)



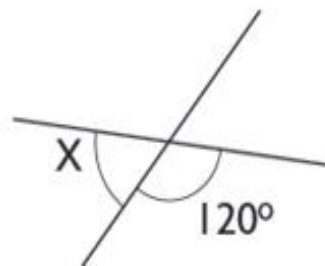
4)



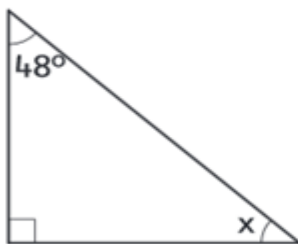
5)



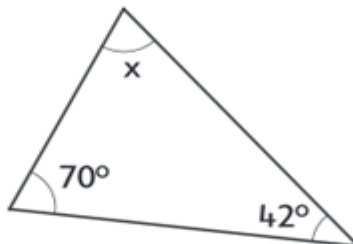
6)



7)



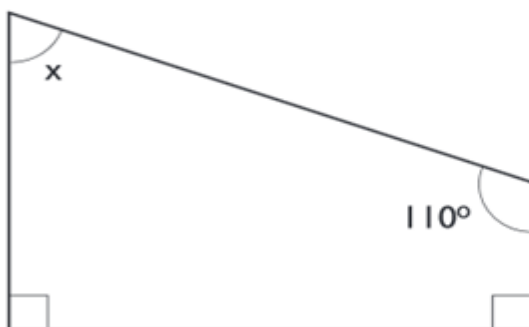
8)



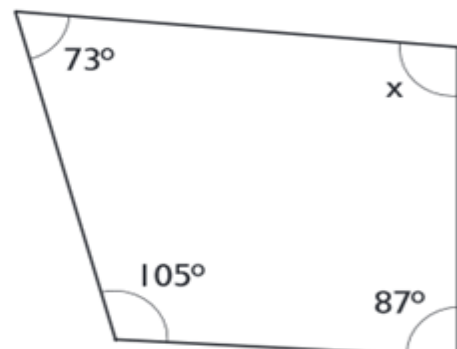
9)



10)



11)



## Convert between units of length, weight, capacity, in the same system

### Metric Units Cross-number

Solve like a crossword puzzle except that numbers replace words.

Look carefully at the units given. Convert the units so they are the same before completing.

|   |   |   |   |    |    |  |    |    |
|---|---|---|---|----|----|--|----|----|
| 1 | 3 | 0 | 0 |    | 2  |  |    | 3  |
|   |   |   |   | 7  |    |  |    |    |
|   |   | 6 |   |    | 8  |  | 9  |    |
|   |   |   |   |    |    |  |    |    |
| 4 |   |   |   | 12 |    |  | 10 | 11 |
|   |   |   |   |    |    |  |    |    |
| 5 |   |   |   |    | 13 |  |    |    |

#### Across

1. 1.5km – 200m = .....m
2. 4m + 25mm = .....mm
4. 0.5kg – 200g = .....g
5. 1.2 litres = .....ml
6. 8.4kg – 76g = .....g
9. 1000cm = .....m
10. 8.2cm = .....mm
12. 0.045kg = .....g
13. 1.5m = .....mm

#### Down

1. 100mm + 2.5cm = .....mm
3. 500cm + 200mm = .....cm
4. 0.3kg + 21g = .....g
7. 6mm × 20 = .....cm
8. 0.5 litres – 45 ml = .....ml
9. 48g + 0.1kg = .....g
11. 50cm + 1.5m = .....cm
12. 4cm + 360mm = .....cm

## Perform calculations with time

### Murder at the Grange

Mrs Marsden was found shot in the dining room. The clock had been knocked off the table as she fell. The clock had stopped working when it fell and it showed a time of 3 o'clock.

There were two suspects. One was Mrs Marsden's favourite niece, who stood to inherit a fortune from Mrs Marsden's will. The niece was being blackmailed by her former lover and had no money of her own. The other suspect was the manager of Mrs Marsden's riding stables, who owed Mrs Marsden money.

Both suspects had visited Mrs Marsden on the day of the murder.

The niece had left home in London at 9.50 am. It took her 25 minutes to get to the station. It took her another 15 minutes to buy her ticket to Northallerton.

Here are the train times. Fill in the missing times.

|                      |       |       |       |
|----------------------|-------|-------|-------|
| <b>London</b>        | 10.25 | 10.45 | 11.45 |
| <b>Northallerton</b> | 13.25 |       |       |
| <b>Darlington</b>    | 13.55 |       |       |

The niece needed to get to Northallerton and then get a taxi which would take 15 minutes. The Manager had been to see her bank manager in Northallerton for a meeting. The meeting started at 13.30 and lasted for 50 minutes. She took a bus from Northallerton to the Grange, ending with a short walk of 5 minutes.

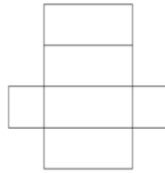
Here are the bus times. Fill in the missing times.

|                         |       |       |       |
|-------------------------|-------|-------|-------|
| <b>West Bridge</b>      | 13.45 | 14.15 | 14.45 |
| <b>Northallerton</b>    | 13.48 |       |       |
| <b>The Old Hospital</b> | 13.51 |       |       |
| <b>The Grange</b>       | 13.57 |       |       |
| <b>East Moor</b>        | 14.05 |       |       |

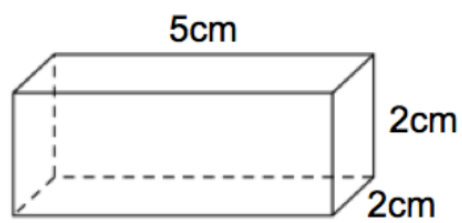
Draw a timeline to show who was the murderer

## Nets

Write down the names of the shapes these nets represent



Draw a net of the cuboid



Each square represents  $1\text{cm}^2$



## Plans and elevation

Label the front elevation, side elevation and plan of the shapes below.

