Mathematics
Topic 1: Whole Numbers

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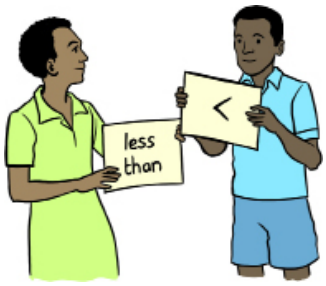
1. Choose the correct words from the list about **quantities** to fill the gaps in the text about number sentences.

greater than	equals	symbols	bigger	smaller	less than

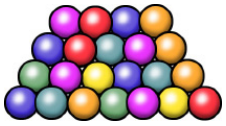
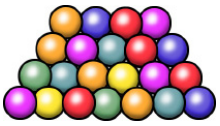
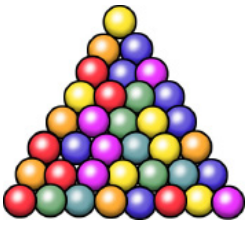
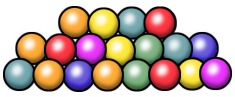
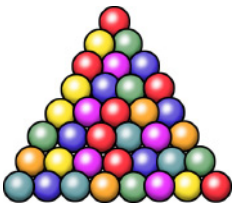
We use a) _____ to make number sentences.

= b) _____

> c) _____



< d) _____

Piles A and B are exactly the same. So we say: 'Pile A equals Pile B'. We write: **Pile A = Pile B**	 Pile A	 Pile B
Pile A is e) _____ So we say: 'Pile A is greater than pile B'. We write: **Pile A > Pile B**	 Pile A	 Pile B
Pile A is f) _____ So we say: 'Pile A is less than Pile B'. We write: **Pile A < Pile B**	 Pile A	 Pile B

2. Use the words from the list about the properties of **addition and multiplication** to fill the gaps in the sentences.

addition	associative	calculation	commutative	distributive	multiplication

The a) _____ property of addition means that the answer will always be the same, no matter in which order numbers are added. The b) _____ property of addition and multiplication means that sets of numbers can be grouped and arranged together in any sequence, and the answer will remain the same. A third property of addition and multiplication is the c) _____ property.

2(3 + 4) can be written as 2 x (3 + 4)

2(3 x 4) can be written as 2 x (3 x 4)

When a d) _____ is written as above, there is an 'invisible' multiplication sign between the number next to the brackets. For e) _____ , this means that 2 is multiplied first by 3, and then by 4. For f) _____ , this means that the factors (the numbers) in the brackets are multiplied together, and then multiplied by 2.

3. Draw a line between each word about **whole numbers** and its correct definition.

associative	A number that is made up of two numbers below ten.
commutative	A way in which multiplication is applied to addition of two or more numbers, where each term inside brackets can be multiplied by a factor outside the brackets.
two-digit	Bigger or more than is usual.
distributive	Capable of being divided by another number.
divisible	Sets of numbers that can be grouped and arranged together in any sequence and the answer will remain the same.
greater	Not the same in amount, number or size.
proportional	These numbers keep the same relationship when they change in size.
unequal	This property of addition means the answer will always be the same, no matter in which order numbers are added.

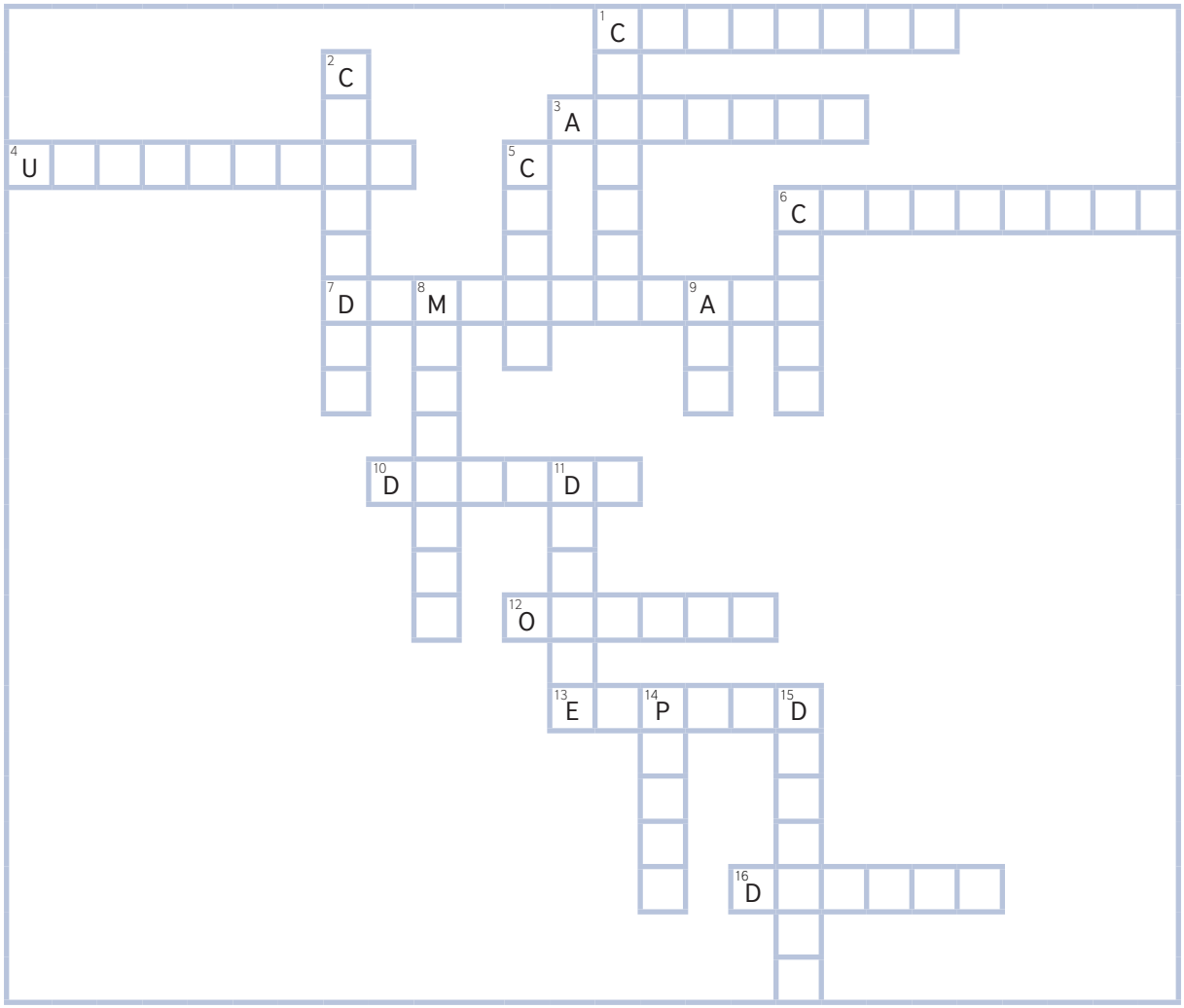
4. Complete the crossword by answering the following questions. All the correct answers are words used in **mathematics**.

Across

1. To finish a task or to add missing parts in order to make something whole.
3. To put things in a tidy or useful order.
4. To show or emphasise that something is correct or important.
6. To discover a number or amount by using mathematics.
7. To show someone how to do something or how something works.
10. To do a calculation to find out how many times a number contains a smaller number.
12. To get the result that you want or need.
13. To write a mathematical expression in a longer form.
16. To remove something that has been written.

Down

1. To show that something is wrong and make it right.
2. To think about something carefully before you make a decision.
5. To calculate how many people or things there are in a group.
6. To examine something in order to get information, or to find out whether it is correct.
8. To add a number to itself a particular number of times.
9. To calculate the total of two or more numbers.
11. To become twice as big, twice as much, or twice as many, or to make something do this.
14. To provide evidence that shows that a calculation is true.
15. To go down in number.



5. Make sentences about **calculations** by matching the beginnings and endings. Write your answers in the grid below.

a)	The number 4 is the multiplier	1	between two things.
b)	The distance from one side of an object to the other is	2	by which another number is divided.
c)	A digit is one of the written numbers	3	(for example, one of the axes on a graph).
d)	Distance is the amount of space	4	from 0 to 9.
e)	The divisor is the number	5	one end of something to the other.
f)	The exponent is a small number or letter written above and to the right of another number	6	in the statement 2 x 4 = 8.
g)	The inverse is the complete opposite	7	known as the breadth.
h)	The length is a measurement of the distance from	8	of a calculation or result.
i)	The multiplicand is a number	9	that can only be divided exactly by itself and the number 1.
j)	A prime number is a number	10	that is multiplied by another number.
k)	The value is a number or amount	11	that is not known and is represented by a letter.
l)	The vertical is a line or position	12	to show how many times the number should be multiplied by itself.

Answers:

a)	b)	c)	d)	e)	f)	g)	h)	i)	j)	k)	l)

6. Circle the correct word to complete each sentence about **mathematical operations**.

a) The amount of space that the surface of a place or shape covers is known as the **perimeter / area / factor**.

b) An average number or amount is called the **mean / base / opposite**.

c) An amount that is calculated by adding several numbers together and dividing the total by the number of things that you added together is known as the **deduction / progression / average**.

d) A number that is used to form a system of counting is called the **first / highest / base** number.

e) The process of adding two or more numbers on top of each other to make finding the total easier is known as **branch / cross / column** addition.

f) An amount or number taken from a total, or the process of taking an amount or number away from a total, is called **deduction / definition / division**.

g) A number that a group of two or more other numbers can be divided by exactly is called a **rough estimate / common factor / long division**.

h) A calculation in mathematics of how many times a number is contained in a larger number is known as a **subtraction / multiplication / division**.

i) A series of numbers in which each number is multiplied by a particular quantity in order to get the next number is called **geometrical progression / arithmetic mean / hire purchase.**

j) The **property / square root / power of a number** is a number which, multiplied by itself, gives you the original number.

7. Put the words in the correct order to make sentences about **terms used in mathematical problems**.

a)	A variable is	that can change	the other numbers in an equation.	depending on	a letter representing a number
Correct sentence:					
b)	The sum is	together.	a total amount	several numbers	made by adding
Correct sentence:					
c)	A solution is	to a problem	in mathematics.	the answer	
Correct sentence:					
d)	A set is	in mathematics.	of numbers	a group	
Correct sentence:					
e)	A ratio is	of two or more	a relationship	between the sizes	numbers or amounts.
Correct sentence:					
f)	The remainder is	cannot be divided	the amount that is left	exactly by another.	when one number
Correct sentence:					
g)	A quotient is	dividing one number by another.	the number that is	the result of	
Correct sentence:					

h)	A proof is	that shows	definitely true.	that a calculation is	information or evidence
Correct sentence:					
i)	A product is	two other numbers.	a number	multiplying	that is the result of
Correct sentence:					
j)	A problem is	that someone is given	as a test of their ability.	a question	to answer
Correct sentence:					
k)	A part is	one of the pieces,	that something consists of.	sections, or aspects	
Correct sentence:					
l)	The perimeter is	such as a square.	the total length	of the sides	of a shape
Correct sentence:					
m)	A power is	for saying	a number by itself.	used in mathematics	how many times you multiply
Correct sentence:					
n)	A diameter is	through the centre, or	the length of this line.	a straight line	that crosses a circle
Correct sentence:					

8. Find the words about **purchasing** in the word search.

N L A D L J M S B R C W I O G B L C S I N T E R E S T F S Y E H A R D V M O O D F C O S A C N G A C S I E F R F E S T A E Z A V C P I D S E F F F P G N A R C Q J A E E G C Q E N D O F G E O D V A A N R J O S K I S S E C T R A P F D O R P U S N I D I G E E S I C P A C R S N S O R A T N X P M N G S O I I E T L D F A S P Y J T O A M N E F A B Z X G W C E S O A M P C E A L L I B L A I E U V O O O I S I M P L E R X I E E C E U U P A I E A V Z W J G U I F E N N A M G N S S R I O B S S I A T D L O N T S S G A E E	amount commission compound deposit discount dividend instalment interest principal simple

Glossary

two-digit	/ tuː ˈdɪdʒɪt/ adj a two-digit number is a number made up of two other numbers, e.g., 23.
according to	/əˈkɔː(r)dɪŋ ˌtuː/ preposition in a way that agrees with or obeys a particular plan, system, or set of rules: The numbers were grouped according to their number bases.
achieve	/əˈtʃiːv/ verb [T] to succeed in doing or having something: Most of the students achieved high test scores.
add	/æd təˈgeðə(r)/ verb [I/T] to calculate the total of two or more numbers: What do you get if you add 75 and 63 together?
among	/əˈmʌŋ/ preposition so that different people receive parts of something when it is divided up: The money has to be shared out among several projects.
amount	/əˈmaʊnt/ noun [C] a quantity of something: This amount (=quantity of money) should be paid within two weeks.
area	/ˈeəriə/ noun [U] the amount of space that the surface of a place or shape covers: The screen has a large surface area.
arithmetic mean	/əˈrɪθmətɪk miːn/ noun [C] an average number or amount.
arithmetical progression	/əˈrɪθmətɪk prəʊˈgreʃ(ə)n/ noun [singular] a series of numbers in which the same number is added to each number to produce the next, for example 3, 6, 9, 12.
arrange	/əˈreɪndʒ/ verb [T] to put things in a tidy or useful order: Here is the list of numbers arranged in ascending order.
arrive at	/əˈraɪv æt/ phrasal verb to reach a solution to a problem: The students arrived at the correct answer.
ascend	/əˈsendɪŋ/ verb [I/T] formal to go upwards, or to climb something: ascending order.
associative	/əˈsəʊsiˌeɪtɪv/ adj means that sets of numbers can be grouped and arranged together in any sequence, and the answer will remain the same.
average	/ˈæv(ə)rɪdʒ/ noun [C] an amount that is calculated by adding several numbers together and dividing the total by the number of things that you added together.
base number	/beɪs ˈnʌmbə(r)/ noun [C] a number that is used to form a system of counting. The usual system of counting uses base 10, and the binary system used in computers uses base 2.
big	/bɪg/ (bigger, biggest) adj large in size, opposite to small: a big number.
branch	/brɑːntʃ/ noun [C] one of the parts of a tree that grows out of its center.
breadth	/bredθ/ noun [C/U] the distance from one side of an object to the other: 5 metres in breadth.
break into	/breɪk ˈɪntuː/ verb [T] to break into smaller pieces, or to make something do this; break down.

calculate	/ˈkælkjʊleɪt/ verb [T] to discover a number or amount by using mathematics: Calculate the size of the angle.
carry	/ˈkæri/ verb [T] to add a number to the bottom of the next row of numbers on the left when adding rows of numbers.
check	/tʃek/ verb [I/T] to examine something in order to get information, or to find out whether it is good or correct: Always check your calculations.
column addition	/ˈkɒləm əˈdɪʃ(ə)n/ noun [U] the process of adding two or more numbers in columns to make finding the total easier.
commission	/kəˈmɪʃ(ə)n/ noun [C/U] an extra amount of money that someone earns when they sell a product or get a new customer: All our salespeople work on commission.
common factor	/ˈkɒmən ˈfæktə(r)/ noun [C] a number that a group of two or more other numbers can be divided by exactly, so 4 is a common factor of 8, 12, and 20: Find the highest common factor of this set.
commutative	/kəˈmjuːtətɪv/ adj the commutative property of addition means the answer will always be the same, no matter in which order numbers are added.
complete	/kəmˈpliːt/ verb [T] to finish something; to add missing parts in order to finish something.
compound interest	/ˈkɒmpaʊnd ˈɪntrəst/ noun [U] interest that is based both on an amount of money that someone has borrowed or saved and on the interest that has been added to it.
consider	/kənˈsɪdə(r)/ verb [I/T] to think about something carefully before you make a decision: Consider the following example of the problem.
copy	/ˈkɒpi/ (copies, copying, copied) verb 1 [T] to make a copy that is the same as the original thing: Copy this table into your notebooks.
correct	/kəˈrekt/ verb [T] to show that something is wrong, and make it right.
count	/kaʊnt/ verb [I/T] to calculate how many people or things there are in a group: All the votes have been counted.
cross	/krɒs/ noun [C] the symbol X, used for showing your choice on a written list, or for showing that an answer is wrong: Put a cross next to the correct answer.
deduction	/dɪˈdʌkʃ(ə)n/ noun [C/U] an amount or number taken from a total, or the process of taking an amount or number away from a total.
definition	/ˌdefəˈnɪʃ(ə)n/ noun [C] a statement of what an expression means: The definition of a prime number.
delete	/dɪˈliːt/ verb [T] to remove something that has been written.
demonstrate	/ˈdemənˌstreɪt/ verb [T] to show someone how to do something or how something works: We will demonstrate various techniques.
deposit	/dɪˈpɒzɪt/ noun [C] a first payment that someone makes when they agree to buy something expensive such as a car or house.
descend	/dɪˈsendɪŋ/ verb [I/T] to go down in number.

diameter	/daɪˈæmɪtə(r)/ noun [C/U] a straight line that crosses a circle through the centre, or the length of this line.
digit	/ˈdɪdʒɪt/ noun [C] one of the written numbers from 0 to 9.
discount	/ˈdɪsˌkaʊnt/ noun [C] a reduction in price: The store is offering a 10% discount on school textbooks.
distance	/ˈdɪstəns/ noun [C/U] the amount of space between two things: the distance from Earth to the Sun.
distributive	/dɪˈstrɪbjuːtətɪv/ adj a way in which multiplication is applied to addition of two or more numbers in which each term inside brackets can be multiplied by a factor outside the brackets.
divide	/dɪˈvaɪd/ verb [I/T] to do a calculation to find out how many times a number contains a smaller number. This is usually shown by the symbol ÷: 10 divided by 2 is 5.
dividend	/ˈdɪvɪdend/ noun [C] a number that is going to be divided by another number.
divisible (by)	/dɪˈvɪzəb(ə)l baɪ/ adj capable of being divided by another number — divisibility /dɪˈvɪzəˈbɪləti/ noun [U].
division	/dɪˈvɪʒ(ə)n/ [C/U] a calculation in mathematics of how many times a number is contained in a larger number.
divisor	/dɪˈvaɪzə(r)/ noun [C] the number by which another number is divided.
double	/ˈdʌb(ə)l/ verb [I/T] to become twice as big, twice as much, or twice as many, or to make something do this: The government doubled the tax on alcohol.
equal	/ˈiːkwəlz/ (equals, equalling, equalled) verb [T] to be the same in value or amount as something else: Five plus three equals eight.
exactly	/ɪgˈzæk(t)li/ adv no more and no less than a particular amount or time - PRECISELY: The distance should measure five centimetres exactly.
exercise	/ˈeksə(r)saɪz/ noun [C] an activity or set of activities that you do in order to learn or practise a skill: I'd like you to do the exercises on page 10.
expand	/ˌɪkˈspændɪd/ verb [T] to write a mathematical expression in a longer form.
exponent	/ɪkˈspəʊnənt/ noun [C] a small number or letter written above and to the right of another number. It shows how many times you should multiply that number by itself.
express	/ɪkˈspres/ verb [T] to show a mathematical quantity or problem in a particular way: A ratio can be expressed as a percentage.
factor	/ˈfæktə(r)/ noun [C] a number that a larger number can be exactly divided by: 2 and 3 are factors of 6.
figure	/ˈfɪgə(r)/ noun [C] a number that has been counted or calculated: This year's sales figures were excellent.
fill in	/fɪl ɪn/ verb [T] to add information in the empty spaces on a document or worksheet: Fill in the answers in the correct places.

form	/fɔː(r)m/ noun [C/U] a type of something or the particular way in which something appears or exists: Write the number in expanded form.
geometrical progression	/ˌdʒiːəˈmetrɪk(ə)l prəʊˈgreʃ(ə)n/ noun [C] a series of numbers in which each number is multiplied by a particular quantity in order to get the next number, e.g., 1, 5, 25, 125.
greater (than)	/greɪt/ adj bigger, or more than is usual: Pile A is greater than pile B.
hire purchase	/ˈhaɪə(r) ˈpɜː(r)tʃəs/ noun [U] a system of buying where someone first pays only a fraction of the total amount and then keeps paying regular instalments until the whole amount is paid.
identification	/aɪˌdentɪfɪˈkeɪʃ(ə)n/ noun [U] the action of recognizing someone or something: The identification of a problem is the first step towards solving it.
instalment	/ɪnˈstɔːlmənt/ noun [C] one of several payments that an amount you owe is divided into: We paid for the television in 12 monthly instalments.
interest	/ˈɪntrəst reɪt/ noun [U] the money that a bank charges or pays you when you borrow or save money: an increase in the interest rate on personal loans.
inverse	/ˌɪnˈvɜː(r)s/ noun [C] the complete opposite of something, for example a calculation or result in mathematics.
involve	/ɪnˈvɒlv/ verb [T] to include something as a necessary part of an activity, event, or situation: Number patterns can involve subtraction.
large	/lɑː(r)dʒ/ adj bigger than usual in size, number, or amount: We can write numbers in order of size, starting with the smallest or the largest.
length	/leŋθ/ noun [C/U] a measurement of the distance from one end of something to the other: Measure the length of the line.
less (than)	/les/ adv, determiner, pronoun a smaller amount.
long division	/lɒŋ dɪˈvɪʒ(ə)n/ noun [C/U] a calculation in mathematics of how many times a number is contained in a larger number.
lowest common multiple (LCM)	/ˌləʊɪst ˌkɒmən ˈmʌltɪp(ə)l/ noun [C] the lowest number that can be divided by all the numbers in a set.
mistake	/mɪˈsteɪk/ noun [C] something that you have not done correctly: A mistake in the calculations.
mental maths	/ˈment(ə)l mæθs/ noun [U] doing calculations and sums in your head rather than on paper.
method	/ˈmeθəd/ noun [C] a way of doing something, especially a planned or established way: Method 1: Find the equivalent fraction out of 10.
multiplicand	/ˌmʌltɪplɪˈkænd/ noun [C] a number that is multiplied by another number.
multiplication	/ˌmʌltɪplɪˈkeɪʃ(ə)n/ noun [U] the process of adding a number to itself a particular number of times.
multiply	/ˈmʌltɪplaɪ/ (multiplies, multiplying, multiplied) verb [I/T] to add a number to itself a particular number of times: If you multiply 3 by 3, you get 9.
multliplier	/ˈmʌltɪplaɪə/ noun [C] the number by which another number (the multiplicand) is multiplied, for example the number 4 is the multiplier in the statement 2 x 4 = 8.

notation	/nəʊˈteɪʃ(ə)n/ noun [U] a set of written signs or shapes that are used in mathematics.
obtain	/əbˈteɪn/ verb [T] to get the result that you want or need: She obtained the correct result from the calculation.
operation	/ˌɒpəˈreɪʃ(ə)n/ noun [C] an action or set of actions that is necessary to achieve something: Division is the inverse or opposite operation of multiplication.
opposite	/ˈɒpəzɪt/ noun [C] something that is completely different from something else: The angles opposite each other that are formed when two lines intersect.
order	/ˈɔː(r)də(r)/ noun [C/U] the way in which a set of things is arranged so that it is clear which thing is first, second, third etc:
part	/pɑː(r)t/ noun [C] one of the pieces, sections, or aspects that something consists of: Write the unequal shares (or parts) as a mathematical ratio.
pattern	/ˈpætə(r)n/ noun [C] a set of lines, shapes, or numbers that are repeated regularly.
perimeter	/pəˈrɪmɪtə(r)/ noun [C] the total length of the sides of a shape such as a square.
power (of)	/ˈpaʊə(r)/ usedin mathematics for saying how many times you multiply a number by itself. For example '10 to the power of 3' means 10 x 10 x 10.
prime number	/praɪm ˈnʌmbə(r)/ noun [C] a number that can only be divided exactly by itself and the number 1, for example 7.
principal	/ˈprɪnsəp(ə)l/ noun [singular] the original amount of money that someone borrows. It is paid back with interest.
problem	/ˈprɒbləm/ noun [C] a question that someone is given to answer as a test of their ability: mathematical problems.
product	/ˈprɒdʌkt/ noun [C] a number that is the result of multiplying two other numbers.
proof	/pruːf/ noun [U] information or evidence that shows that a calulation is definitely true.
property	/ˈprɒpə(r)ti/ noun [C] a quality or feature of something: Show the properties of each of the lines.
proportional	/prəˈpɔː(r)ʃ(ə)nəl/ adj proportional numbers keep the same relationship when they change in size.
prove	/pruːv/ verb [T] to provide evidence that shows that a calculation is true.
quotient	/ˈkwəʊʃ(ə)nt/ noun [C] the number that is the result of dividing one number by another.
rate of sharing	/reɪt əv ʃeərɪŋ/ noun [C] the number of times that a number is shared out or divided among a group or other number.
ratio	/ˈreɪʃiəʊ/ (plural ratios) noun [C] a relationship between the sizes of two or more numbers or amounts.
remainder	/rɪˈmeɪndə(r)/ noun [singular] the amount that is left when one number cannot be divided exactly by another.
roman numeral	/ˈrəʊmən ˈnjuːmərəl/ noun [C] 'I', 'V', 'X', 'L', 'C', 'D', and 'M' sometimes used to represent numbers, e.g., VI represents 6.
rough estimate	/rʌf ˈestɪmeɪt/ noun [C] an amount guessed or calculated using information available: The figure is just a rough estimate.
rule	/ruːl/ noun [C] a rule explains what you can or cannot do in solving a problem or doing a calculation.

set	/set/ noun [C] a group of numbers in mathematics.
simple interest	/ˈsɪmp(ə)l ˈɪntrəst/ noun [U] interest earned on money that someone has invested, calculated once a year on the principal.
solution	/səˈluːʃ(ə)n/ noun [C] the answer to a problem in mathematics.
square root	/skweə(r) ruːt/ noun [C] The square root of a number is a number which multiplied by itself, gives you the original number: The square root of 9 is 3.
subtract	/səbˈtrækt/ verb [I/T] to take a number or amount from another number or amount — subtraction.
sum (of)	/sʌm/ noun [U] a total amount made by adding several numbers together: What's the sum of those three numbers?
symbol	/ˈsɪmb(ə)l/ noun [C] a mark, letter, or number that is used to represent something in mathematics.
tick	/tɪk/ noun [C] the symbol ü that you write next to an answer in order to show that it is correct.
underline	/ˌʌndə(r)ˈlaɪn/ verb [T] to show or emphasize that something is correct or important.
unequal	/ʌnˈiːkwəl/ adj not the same in amount, number, or size.
value	/ˈvæljuː/ noun [C] a number or amount that is not known and is represented by a letter.
variable	/ˈveəriəb(ə)l/ noun [C] a letter representing a number that can change depending on the other numbers in an equation.
vertical	/ˈvɜː(r)tɪk(ə)l/ noun [C] a vertical line or position,for example the vertical axis on a graph.
work out	/wɜː(r)k aʊt/ phrasal verb to find an answer to something by calculating it.

Key:

1. a) symbols, b) equals, c) greater than, d) less than, e) bigger, 6) smaller

2. a) commutative, b) associative, c) distributive, d) calculation, e) addition, f) multiplication

3.

associative	A number that is made up of two numbers below ten.
commutative	A way in which multiplication is applied to addition of two or more numbers, where each term inside brackets can be multiplied by a factor outside the brackets.
two-digit	Bigger or more than is usual.
distributive	Capable of being divided by another number.
divisible	Sets of numbers that can be grouped and arranged together in any sequence and the answer will remain the same.
greater	Not the same in amount, number or size.
proportional	These numbers keep the same relationship when they change in size.
unequal	This property of addition means the answer will always be the same, no matter in which order numbers are added.

4. **Across:** 1. complete, 3. arrange, 4. underline, 6. calculate, 7. demonstrate, 10. divide, 12. obtain, 13. expand, 16. delete; **Down:** 1. correct, 2. consider, 5. count, 6. check, 8. multiply, 9. add, 11. double, 14. prove, 15. descend

5. a) 6, b) 7, c) 4, d) 1, e) 2, f) 12, g) 8, h) 5, i) 10, j) 9, k) 11, l) 3

6. a) area, b) mean, c) average, d) base, e) column, f) deduction, g) common factor, h) division, i) geometrical progression, j) square root

7.

a)	A variable is	a letter representing a number that can change depending on the other numbers in an equation.
b)	The sum is	a total amount made by adding several numbers together.
c)	A solution is	the answer to a problem in mathematics.
d)	A set is	a group of numbers in mathematics.
e)	A ratio is	a relationship between the sizes of two or more numbers or amounts.
f)	The remainder is	the amount that is left when one number cannot be divided exactly by another.

g)	A quotient is	the number that is the result of dividing one number by another.
h)	A proof is	information or evidence that shows that a calulation is definitely true.
i)	A product is	a number that is the result of multiplying two other numbers.
j)	A problem is	a question that someone is given to answer as a test of their ability.
k)	A part is	one of the pieces, sections, or aspects that something consists of.
l)	The perimeter is	the total length of the sides of a shape such as a square.
m)	A power is	used in mathematics for saying how many times you multiply a number by itself.
n)	A diameter is	a straight line that crosses a circle through the centre, or the length of this line.

8.