Using numbers

This chapter is going to show you:

- how to use number skills in real life
- how to use number in financial mathematics
- how to use a number line to compare negative numbers, including decimals
- how to use the symbols < (less than) and > (greater than)
- how to use a number line to calculate with negative numbers
- how to add and subtract negative numbers
- how to multiply negative numbers by both positive and negative numbers.

You should already know:

- how to write and read whole numbers, decimals and fractions
- how to add and subtract positive numbers, decimals and fractions
- multiplication tables up to 12×12
- how to use a calculator to do simple calculations.

About this chapter

If you travel east across the world you go forward in time! If you travel west you go backwards. Because of the Earth's rotation the day starts at different times across the world. So when it is 8 am in London it is 11 am (+ 3 hours) in Moscow and 3 am (– 5 hours) in New York. If you fly to one of them you can work out your arrival time by adding the time taken by the flight to the positive or negative time difference at your destination. Understanding negative numbers is also important if you're travelling to a destination with sub-zero temperatures so you can pack the right clothes. There are 24 time zones in the world. The World Clock

in Berlin, shown here, tells you what the time is in all of them at any one moment!

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IRKUTSK

ULAN-BATER

PEKING SHANGHAI MANILA

PERTH

HENGKENG KUALA LUMPUR SINGATUR JAKUTSK

PJÖNGJANG TOKYO SEOUL CHABAROWSK

SYDNEY CANBERRA MELBOURNE

1.1 Charts and financial mathematics

Learning objectives

- To carry out calculations from information given in tables and charts
- To understand and use financial language

Key words	
balance	chart
credit	debit

You use mathematics every day, often without realising it. When you work out times and distances, read charts and spend and save money, you are using mathematical skills.

Charts

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Maps often have **charts** attached to them, showing the distances between key places.

Example 1

The table shows the flight distances, in kilometres, between four cities.

- **a** How many kilometres, in total, is it from Paris to Dubrovnik and back?
- **b** How much further is it from Delhi to Glasgow than from Paris to Glasgow?

Delhi				
Dubrovnik	5099			
Paris	6580	1712		
Glasgow	6885	2426	893	
	Delhi	Dubrovnik	Paris	Glasgow

- **a** The distance from Paris to Dubrovnik is 1712 km, so the return journey is 3424 km in total.
- **b** The distance from Delhi to Glasgow is 6885 km.

The distance from Paris to Glasgow is 893 km.

The distance from Delhi to Glasgow is 5992 km further. (6885 km – 893 km = 5992 km)

Delhi				
Dubrovnik	5099			
Paris	6580	1712		
Glasgow	6885	2426	893	
	Delhi	Dubrovnik	Paris	Glasgow

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Planning and making purchases

Information about prices is often given in tables. This makes it easier to read.

Example 2

A park hires out bicycles. These are the prices.

Hire period	Bicycle	Tandem
2 hours	£7.50 adult	£13.50
	£5.00 child	
4 hours	£12.50 adult	£19.50
	£7.50 child	
All day	£15.00 adult	£25.00
	£10.00 child	

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- **a** How much does it cost to hire bicycles for 4 hours for 1 adult and 2 children?
- **b** How much more does it cost to hire two tandems for a whole day than for 2 hours?
 - **a** Total cost for 4 hours for 1 adult and 2 children is $\pounds 12.50 + \pounds 7.50 + \pounds 7.50 = \pounds 27.50$.
 - **b** One tandem costs £25.00 for a whole day but only £13.50 for 2 hours.

The difference is $\pounds 25.00 - \pounds 13.50 = \pounds 11.50$.

The cost for two tandems will be $\pm 11.50 \times 2 = \pm 23$ more.

Bank statements

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A bank statement gives you detailed information about your bank account. It shows details of money that has been paid in or out of the account, and the amount of money remaining.

A **debit** is the amount paid out of an account.

A credit is the amount paid in to an account.

The **balance** is the amount of money remaining in the account.

Example 3							
Here is a bank sta	Here is a bank statement.						
Statement numbe	r: 9		Acco	ount number 13579246			
Date	Details	Debit (£)	Credit (£)	Balance (£)			
31-01-2014	Opening balance			417.83			
01-02-2014	Interest		15.41				
03-02-2014	Cash withdrawal	180.00					
05-02-2014	The music shop	9.79					
26-02-2014	Salary		354.68				
28-02-2014	Closing balance			598.13			

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a Copy the bank statement and complete the balance column.

b How much was paid out from the account in February?

1 Using numbers

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a	Statement number	r: 9	Account number 13579246		
	Date	Details	Debit (£)	Credit (£)	Balance (£)
	31-01-2014	Opening balance			417.83
	01-02-2014	Interest		15.41	433.24
	03-02-2014	Cash withdrawal	180.00		253.24
	05-02-2014	The music shop	9.79		243.45
	26-02-2014	Salary		354.68	598.13
	28-02-2014	Closing balance			598.13

b £189.79 was paid out.

Example 4

Here are two readings from a gas meter.



April 2014

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The readings give the number of metric units of gas that have been used.

Charges are based on kilowatt hours (kWh).

To convert metric units to kilowatt hours, multiply the number of units by 11.2.

The first 670 kWh are charged at 8.40p per kWh.

The remainder are charged at 5.00p per kWh.

a How many metric units of gas were used in the period from January to April?

- **b** Work out the cost of the gas used.
 - **a** The number of units used is 24569 24401 = 168 metric units.
 - **b** 168 metric units = 168 × 11.2 kWh

= 1881.6 kWh

670 kWh at 8.40p = £56.28

1881.6 – 670 = 1211.6 kWh

 $1211.6 \text{ at } 5.00\text{p} = \pounds 60.58$

The cost of the gas used is $\pm 56.28 + \pm 60.58 = \pm 116.86$.

Exercise 1A



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A TV and broadband package costs ± 23.50 a month for the first 6 months and then ± 49.99 per month.

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Work out the total cost for the first two years.

Work out the total cost of this mobile phone contract over the length of the plan. Include the cost of the phone in your total.



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a Copy this bank statement.

Then fill in the balance column.

Date	Details	Debit (£)	Credit (£)	Balance (£)
31-01-2014	Opening balance			326.25
01-02-2014	Interest		8.21	
05-02-2014	Shirt shop	53.62		
05-02-2014	The hungry cafe	16.88		
05-02-2104	Birthday shop	22.79		
26-02-2014	Paid in		228.54	
28-02-2014	Closing balance			

- **b** How much was paid out on the 5 February?
- c What is the difference between the opening and closing balances?

Four friends agreed to deposit a fixed amount each month into their bank accounts. Copy and complete the table.

Name	Heather	lain	Joanna	Kenny
Opening bank balance	£222.22	£194.63	£133.95	£96.80
Amount saved per month	£17.50	£22.50	£30.00	£48.00
Amount saved in 12 months				
Closing bank balance				

Who had the most money at the end of 12 months?

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This chart shows the distances between four cities in England.

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a Copy and complete the mileage chart.





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Work out the shortest route to visit all four cities. Start from Sheffield.

These are two readings from an electricity meter. The units are given in kWh.January 2014April 2014



The first 150 kWh are charged at 20.8p per kWh.

The remainder are charged at 12.5p per kWh.

a How many kWh of electricity were used between January and April?

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b Work out the cost of the electricity used.

1.1 Charts and financial mathematics

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These are two readings from a gas meter.

April 2014

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The readings give the number of metric units used.

The first 670 kWh are charged at 8.40p per kWh.

The remainder is charged at 5.00p per kWh.

- a How many metric units of gas were used in the period from January to April?
- **b** Work out the cost of the gas used.

Activity: Sending a parcel

January 2014

Use an internet search to find the cheapest way to send a 15 kg parcel from the United Kingdom to Poland. Assume the parcel is 30 cm long, 15 cm wide and 20 cm high.



To convert metric units to

kilowatt hours, multiply the number of units by 11.2.

Hint

1.2 Positive and negative numbers

Learning objectives

- To use a number line to order positive and negative numbers, including decimals
- To understand and use the symbols < (less than) and > (greater than)

Look at the two pictures.

What are the differences between them?

Every number has a sign. Numbers greater than 0 are called **positive numbers**. Although you do not always write it, every positive number has a positive (+) sign in front of it.

Numbers less than 0 are called **negative numbers** and must always have a negative (–) sign in front of them.

The positions of positive and negative numbers can be shown on a number line. The value of the numbers increases as you move from left to right. For example, -5 is **greater than** -10, 2 is greater than -5 and 8 is greater than 2.



Key wordsgreater thanless thannegative numberpositive number

Temperature +26.5 °C



Temperature –13.0 °C



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1 Using numbers

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You can use the number line to compare the sizes of positive and negative numbers. You can also use it to solve problems involving addition and subtraction.

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For example:

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-4 < 7 means 'negative 4 is less than 7'.

-3 > -8 means 'negative 3 is greater than negative 8'.

Example 7

State whether each statement is true or false.

a 6.5 > 8.1 **b** -7.2 > -1.8 **c** -3.4 > -3.8

Putting each of these pairs on the number line shows that:

a 6.5 > 8.1 is false



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1.2 Positive and negative numbers

Exercise 1B

	Write down the highest and lowest temperatures in each group.					
	a -4 °C, -2 °C, 0 °C b -8 °C, -15 °C, -10 °C c -20 °C, -19 °C, -15 °C					
2	Work out the difference between the temperatures in each pair.					
	a -8 °C and 17 °C b -13 °C and -25 °C c 14 °C and -7 °C					
3	On Monday the temperature at noon was 2 °C. Over the next few days these temperature changes were recorded.					
	Monday to Tuesday down eight degrees					
	Tuesday to Wednesday up three degrees					
	Wednesday to Thursday down five degrees					
	Thursday to Friday up nine degrees					
	What was the temperature on Friday?					
4	Put these numbers in order, from smallest to largest.					
	a 13, -8, 2, -7, 9 b -11, -7, 8, -12, -10 c 0, -4, -6, -11, 4					
	d 9, -13, 8, -9, -14 e -7, -9, -18, 10, -10 f 19, -8, 7, -17, 5					
5	State whether each statement is true or false.					
	a 7.5 > 3.8 b 2.9 < 16.1 c 5.8 < -6.2 d $-8.6 > -5$					
	e $-2.7 < -9.1$ f $-7.2 > 1.3$ g $-4.3 < -3.5$ h $-9.3 < 3$					
6	Copy each statement and put < or > into the \Box to make it true.					
	a -5.3 4.2 b -7.8 -10.6 c 3.2 -3.5 d -12.6 -2.4					
PS 7	Work out the number that is halfway between the numbers in each pair.					
	a -17 2 b -9 7 c -23 -7					
8	Put these temperatures in order, from highest to lowest.					
	15.5 °C, -4.6 °C, 15.8 °C, -4.9°C, -3.5 °C					
9	Work out the differences between the temperatures in each pair.					
	a -4 °C and 6 °C b -2 °C and -4 °C c 7 °C and -8 °C					
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24/01/14 9:14 PM

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On one day in December the temperature was 2 $^\circ\mathrm{C}$ in London and –4 $^\circ\mathrm{C}$ in Edinburgh.

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How much lower was the temperature in Edinburgh than in London?

11 a Copy this bank statement.

Then fill in the balance column.

Date	Details	Debit (£)	Credit (£)	Balance (£)
31-01-2014	Opening balance			187.00
05-02-2014	Cash withdrawal	53.62		
18-02-2014	Cash withdrawal	228.54		
28-02-2014	Closing balance			



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Explain why the closing balance is negative.

Challenge: Changing state

b

A The table shows the temperatures at which some substances change from being solids to become liquids.

Fluid	Temperature (°C)
Butane	-138
Carbon dioxide	-79
Castor oil	-10
Chloroform	-64
Ether	-116
Glycerine	-8
Linseed oil	-20
Mercury	-39
Nitrogen	-210
Turpentine	-59
Water, fresh	0
Water, sea	-3

Copy the table and list the temperatures, in order of size.

Make sure that the highest temperature is at the top and the lowest is at the bottom.

- **B** Which substances are liquid at –60 °C?
- **C** Solid nitrogen melts at -210 °C. How many degrees warmer does it need to be before solid carbon dioxide melts?

1.3 Simple arithmetic with negative numbers

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Learning objectives

 Key words

 add
 brackets

- To carry out additions and subtractions involving negative numbers
- To use a number line to calculate with negative numbers

You can use a number line to **add** and subtract positive and negative numbers.



c Using two steps this time, 6 - 12 - 3 = -9

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Look at these patterns.

8 + 2 = 10 2 + 8 = 108 + 0 = 8 0 + 8 = 88 + (-2) = 6 (-2) + 8 = 68 + (-4) = 4 (-4) + 8 = 4

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Notice that8 + (-2) = 6 and (-2) + 8 = 6 have the same value as 8 - 2 = 6and8 + (-4) = 4 and (-4) + 8 = 4 have the same value as 8 - 4 = 4.

Adding a negative number gives the same result as subtracting the corresponding positive number.

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Example 9

Worl	Work out the answers.								
a 5 -	+ (-3)	b 20 + (-	-4) c (-5)) + (-2)					
а	5 + -3 = 5 - 3	b	20 + -4 = 20 - 4	С	(-5) + (-2) = (-5) - 2				
	= 2		= 16		= -7				

Exercise 1C

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	Work out the answ	ers.					
	a 8–19	b 4 – 13 c 12 – 15	d 13 + 19				
	e 21 – 13	f 34 - 34 g -11 + 21	h -9 - 12				
	i −17 − 13	j -16 + 8 k -12 - 14	I −18 + 6				
	m $-32 - 23 + 24$	n -17 + 21 - 32 o -23 + 14	-27 p -102 + 103 - 95				
2	Copy and complet	e these calculations.					
	a 16 + (-7) b	28 + (-13) c $26 + (-17)$ d	26 + (-15) e $(-26) + (-27)$				
	= 16 - 7	= 28 - 13 = 26 -					
	=	= =	= =				
3	Use the number lir	e below to work out the answers.					
	a 13 – 15	b 18 + (-12) c 4 + (-15)	d 13 + (-3)				
	e (−12) + (−3)	f $12 - 20$ g $(-14) + 2$	0 h 0-15				
	i 12 + (-15)	j $(-8) + (-6)$ k $12 + (-12)$	2) I $15 + (-15)$				
	m $14 + (-20)$	n $15 + (-25)$ o $0 + (-11)$	p $(-11) + (-4)$				
	-15 -14 -13 -12 -11 -10 -9	-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3	4 5 6 7 8 9 10 11 12 13 14 15				
4	Work out the answ	ers.					
	a 24 + (-15)	b (-25) + (-30) c 70 - 98	d $(-17) + (-28)$				
	e 53 + (-17)	f $(-60) + 60$ g $45 + (-60)$	D) h 124−242				
	i 113 + (-98)	j (-140) + (-25) k 36 + (-55	5) I $(-19) + (-29)$				
5	Work out the total	of the numbers in each list.					
-	a 15, -24, 17, -8	b , -19, 23 b -12, 20, 35, -3	8, -45, 20				

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a

In each magic square, all the rows, columns and diagonals add up to the same total. Copy and complete the squares.

-24

-9

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16		6	b		
	0				-15
		-16		-6	



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Alf has £124 in the bank. He writes a cheque for £135. How much has he got in the bank now?

Problem solving: Magic squares

A In this 4×4 magic square, all of the rows, columns and diagonals add to -18. Copy and complete the square.

-27			15
6			-12
		18	-3
	3	-15	

B In this 4 × 4 magic square, all of the rows, columns and diagonals add to the same number. Copy and complete the square.

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0		-26	-6
	-10		
-14	-18	-20	
-24			-30

1 Using numbers

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1.4 Subtracting negative numbers

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Learning objective

• To carry out subtractions involving negative numbers

Look at this pattern of numbers.

Notice that 8 - (-2) = 10 has the same value as 8 + 2 = 10

and

8 - (-3) = 11 has the same value as 8 + 3 = 11.

Subtracting a negative number is the same as adding a positive number.

8 - 3 = 5
8 - 2 = 6
8 - 1 = 7
8 - 0 = 8
8 - (-1) = 9
8 - (-2) = 10
8 - (-3) = 11

Key word

subtract

Example 10

Work out the answers.

a 12 –(–15) **b** 23 –(–17)

a 12 –(-15) = 12 + 15 = 27 **b** 23 –(-17) = 23 + 17 = 40

Exercise 1D

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Copy and complete these calculations. **c** 22 – (–18) **a** 16 – (–12) **b** 13 – (–16) **d** -24 - (-15) **e** (-16) - (-27) $= 22 + \square$ $=\square$ = 16 + 12= 13 + 16= $=\square$ = $=\square$ = = Use the number line below to work out the answers. **a** 13 – (–2) **b** 7 – (–8) **c** (-14) - (-9)**d** 6 - (-9)g (-14) - (-20) **e** (−12) − (−8) **f** (-12) - (-10)**h** (-11) - (-19)i 8 - (-5)i (-13) - (-6)**k** (-15) - (-8)(-12) - (-6)**m** (-15) - (-7)**n** (-14) - (-25)**o** 0 – (–11) **p** (-13) - (-7)-15 -14 -13 -12 -11 -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 Work out the answers. **a** 30 – (–18) **b** (-25) - (-25) **c** 32 – (–100) **d** (-17) - (-17) **g** −21 − (−43) **e** 29 – (–18) f 36 - (-36)**h** -350 - (-290)i 106 - (-78)i (-123) - (-78)**k** 36 - (-45)(-18) - (-49)Work out the answers. **a** 27 + 16 - (-38)**b** (-42) - 31 - (-18)340 - (-123) + (-91)**d** (-102) + 31 - (-50)С

1.4 Subtracting negative numbers

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Copy and complete the table. Draw a number line to check your answers.

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Maximum temperature (°C)	8	5	-1		2	2	9
Minimum temperature (°C)	-11	-6		-9	-8		-2
Difference (degrees)	19		8	14		6	

A fish is 12 m below the surface of the water. A fish eagle is 17 m above the water. How many metres must the bird descend to get the fish?

Challenge: Marking a test

A A test consists of 50 questions. A correct answer earns 3 marks, a wrong answer gets -2 marks and -1 mark is given if an answer is not attempted.

Work out each pupil's score.

- a Eve gets 32 right, 10 wrong and did not attempt 8.
- **b** Sophia gets 20 right, 20 wrong and did not attempt 10.
- c Oliver gets 25 right and 25 wrong.
- **B** Andrew scores 104 points. Can you work out how he did this?
 - A computer spreadsheet is useful for this activity.

1 Using numbers

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1.5 Multiplying negative numbers

Learning objective

• To carry out multiplications involving negative numbers

This diagram shows the result of multiplying both positive and negative numbers by a positive number. In this example all numbers are multiplied by +2.

Key words

product

multiply

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This shows that:

- multiplying a positive number by another positive number gives a positive number
- multiplying a negative number by a positive number gives a negative number.

To summarise this:

 $(-) \times (+) = (-)$ and $(+) \times (+) = (+)$

Example 11

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Work out the answers.

a -12×4 **b** -7×3

a
$$-12 \times 4 = -48$$
 b $-7 \times 3 = -21$

What happens if you multiply a number by a negative number?

This diagram shows positive and negative numbers multiplied by -2.



This shows that a positive number multiplied by a negative number gives a negative result, as in the first diagram. Here it is just shown the other way round. But this diagram also shows that a negative number multiplied by a negative number gives a positive number.

To summarise this:

 $(-) \times (-) = (+)$ and $(-) \times (+) = (-)$

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To help you remember:

• When multiplying numbers with a different sign, the answer is negative.

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• When multiplying numbers with the same sign, the answer is positive.

Example 12

Work out the answers.

a $8 \times (-5)$ **b** -4×-6

a $8 \times (-5) = -40$ **b** $-4 \times -6 = 24$

Exercise 1E

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Wo	ork out the answe	ers.					
а	$-2 \times (-1)$	b	$-3 \times (-4)$	С	-6×7	d	-1×2
e	$-4 \times (-3)$	f	$8 \times (-2)$	g	$5 \times (-2)$	h	$-2 \times (-6)$
i	-3 × 1	j	-4×10	k	$-3 \times (-3)$	I	$(-8) \times (-9)$
Wo	ork out the answe	ers.					
а	-2×-7	b	-3×-9	С	-7×8	d	-1×12
e	-3×-5	f	8×-6	g	4×-11	h	-2×-8
i	-5×1	j	-3×13	k	-8×-12	I	-7×-9

In each of the brick walls below, you need to work out the number to write in an empty brick by multiplying the numbers in the two bricks below it. Copy and complete each brick wall.



a Julie asked Chris to think of two numbers smaller than ten and tell her their product.



Write down the four possible pairs of numbers Chris could have been thinking of.

1 Using numbers

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b Chris asked Julie to think of two numbers smaller than ten and tell him their product.

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Julie said: 'The product is 12.'

Chris said that there were four different possible sets of numbers with that product. Write down the four possible pairs of numbers Julie could have been thinking of.

b

 ×
 1
 2
 3
 4

 -5

 -6

 -7

 -8

Copy and complete the following multiplication grids.

×	-1	-3	-5	-7
-9				
-11				
-13				
-15				

Work out the answers.

а

a	7×-18	b	3 – 12	С	11×-14	d	2 18	e	-9×13	f	-33 - 33
g	-10 + 23	h	-8×-11	i	-11×-12	j	-15 + 7	k	-11 - 15	I	-14×9
m	-31×-4	n	-7 + 23	0	-25×12	р	-12 + 13	q	-7 + 18	r	-8×-18

Write down the next three numbers in each number sequence.

a	1, -2, 4, -8,,,	b	-1, -3, -9, -27,,,

- **c** -1, 5, -25, 125, ..., ..., **d** 1, -4, 16, -64, ..., ..., ...
- **a** In each brick wall, work out the number to write in an empty brick by multiplying the numbers in the two bricks below it. Copy and complete each brick wall.



b Andy said: 'You will always have a positive number at the top of the brick wall if there are two negative numbers in the bottom layer.'

Is Andy correct? Explain your answer.

c What combination of positive and negative numbers do you need on the bottom layer to end up with a negative number at the top?

Challenge: Number puzzle

A Choose any negative number from -1 to -12.
Subtract 9, then multiply by -2 and add the number you first thought of.
Now add together the digits of the final number.
What do you notice?

B Try this again with more numbers.

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Ready to progress?

I can show my understanding of how the number line extends to include negative numbers.

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I can understand and use the inequality symbols < for less than and > for greater than. I can use my understanding of negative numbers to solve simple real-life problems. I can carry out addition and subtraction involving negative numbers.

I can carry out multiplications involving negative numbers.

Review questions

- The keel (bottom) of a cruise ship is 7 m below the surface of the water. The deck is 27 m above the water. What is the total height, from deck to keel?
 Harry is on the 29th floor of a skyscraper. He goes up 18 floors and then down 23 floors. He wants to go to the 2nd floor. How many floors does he need to go down now?
 - a Alisha opens a bank account with a deposit of £400. In the next two weeks she takes out £170, deposits £130 and takes out £120.

How much is in her account now?

- b Next, Alisha deposits £60 and takes out £170. How much is in her account now?
- 4 Karen and Geza have parked their car on level –5 of the shopping centre car park.

They take the lift to the shops on level +6, then Karen realises she has left her purse in the car. She goes back to the car to get it. Then she returns to the shops and meets Geza on level +4.

How many levels has Karen travelled through altogether?

5 This is a bank statement.

Statement num	ber: 10		mber 14628769	
Date	Details	Debit (£)	Credit (£)	Balance (£)
31-01-2014	Opening balance			827.54
01-02-2014	Wage		252.71	
03-02-2014	Cash withdrawal	130.00		
05-02-2014	Transfer to savings account	250.00		
08-02-2014	Wage		252.71	
28-02-2014	Closing balance			

1 Using numbers

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- **a** Copy the statement and complete the balance column.
- **b** Explain the difference between a debit and a credit.
- 6 The Mariana Trench in the Pacific Ocean has a maximum depth of 10911 metres below sea level. The summit of Mount Everest is 8848 metres above sea level.

- **a** How much higher than the base of the trench is the summit of Mount Everest?
- **b** If Mount Everest was set in the deepest part of the trench, how far would its summit be below sea level?

In a popular TV programme, each of two teams has to buy three items at an antiques fair.

The items are sold at auction and the team that makes more money wins and keeps any profit they make.

Copy and complete each team's score sheet.

a Red team

Item	Buying price (£)	Selling price (£)	Profit (£)
Silver dish	59		-18
Umbrella		47	+14
Toy car	45	55	
Total	137		

b Blue team

ltem	Buying price (£)	Selling price (£)	Profit (£)
Necklace		55	+17
Doll	49	85	
Watch	110		-52
Total	197		



d

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c Which team won and by how much?

Teams can go for a bonus buy, chosen by an expert.The Red team bonus buy was bought for £33 and sold for £25.The Blue team bonus buy was bought for £21 and sold for £29.Copy and complete this table to show who would win in each case.

	Red team without the bonus buy	Red team with the bonus buy
Blue team without the bonus buy		
Blue team with the bonus buy		



Work out the answers.

a $5 \times (-1)$ b -3×9 c -8×-7 d -11×12 e $-9 \times (-7)$ f $8 \times (-3)$ g $5 \times (-12)$ h $-12 \times (-8)$ i -23×-1 j -14×100 k $-30 \times (-10)$ l $(-8) \times (-90)$

Problem solving Where in the world?

A Where shall we go?

David and Hannah were discussing where they could go for their honeymoon in the summer.

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They were interested in the places listed in the table below. They worked out the time difference from the UK for each one.

1 Which place is furthest behind the UK, in terms of time?

- 2 What is the time difference between Reykjavik and Amsterdam?
- 3 What is the time difference between San Francisco and New York?
- **4** What time will it be in Bangkok when it is 10:00 am in the UK?
- 5 What time is it in New Delhi when it is 6:00 pm in New York?

Contraction of the	City	Difference from UK time (hours)
	Amsterdam	+1
	Bangkok	+7
No. 1 and a	Hong Kong	+8
A STATEMENT	New Delhi	+5:30
	New York	-5
NA TANK	Reykjavik	0
NAME AND ADDRESS OF AD	San Francisco	-8
	Sydney	+11

1 Using numbers

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B How shall we get there?

The couple decided to go to Sydney, so they looked up some flight times and prices.

David and Hannah cannot get a direct flight from Heathrow to Sydney.

1 What is the difference in price between the most expensive flight and the cheapest flight to Sydney?

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- 2 They plan to leave Heathrow on 20 August. What date and time would each flight get them into Sydney?
- **3** They need to arrive back into Heathrow on 3 September. What date and times could they get a flight back?
- **4** They want to leave Heathrow on 20 August and be back in Heathrow on 3 September. What combination of flights gives them:
 - **a** the longest time in Sydney
 - **b** the least time in Sydney?

		Heathrow to Sydney			Sydney to Heathrow		
	Fare (£)	Departure	Arrival (local time)	Approximate journey time (hours)	Departure	Arrival (local time)	Approximate journey time (hours)
	830	21:00	10:00	26	09:30	15:30	41
	890	16:00	18:00	39	10:50	05:50	30
IN N	1092	19:15	07:15	25	14:00	03:00	24

Problem solving

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