Benjamin Britten Academy of Music and Mathematics

MATHEMATICS HOMEWORK BOOKLET

Year 8 Book B

SPRING TERM

NAME:

CONTENTS

How does it work?

- One homework will be set a week
- The set and due date for each homework will be written on this page
- Some homework will need completing on this booklet, others on the internet
- If you need help logging onto a website, you need to see your class teacher
- If you need help with the homework task, you must speak to your teacher before the due date

Log in details:

Below are the log in instructions you will need in order to access and complete some of the homework tasks in this booklet.

Mathswatch

Username—firstnamelastname@benjamin

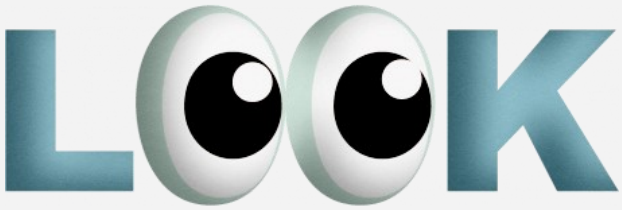
Password—your DOB (format: monthDYYYY)

Completing your homework

All homework tasks need to be completed in this booklet or on a specific website.

There are also **answers** for all booklet tasks at the back of the booklet. Part of your homework task each week is to **mark your work**. Make sure you mark all your answers in another colour pen, making any corrections if you need to.

Remember - if you need help, you must speak to your teacher **before** the due date.

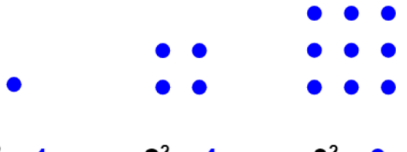


If you see the logo above next to a task, you can type the clip number into Mathswatch for extra help!

Watch the video and make notes, then try the homework task again. If you still need help, then speak to your maths teacher at school.

HOMEWORK 1: NUMERACY

Square Numbers

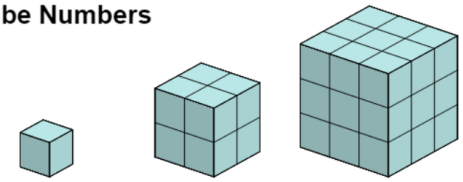


$1^2 = 1$ 1×1

$2^2 = 4$ 2×2

$3^2 = 9$ 3×3

Cube Numbers



$1^3 = 1$ $1 \times 1 \times 1$

$2^3 = 8$ $2 \times 2 \times 2$

$3^3 = 27$ $3 \times 3 \times 3$

Which of the following are square numbers? Choose all that apply.

10	16	9	27	3	8	48	1	55	36

Which of the following are cube numbers? Choose all that apply.

4	1	100	9	1000	6	64	125	27	81

Find:

a) a square number between 20 and 30

b) a cube number less than 5

c) an odd square number between 50 and 100

d) a cube number that ends in 7

Work out the missing values:

a) $5^{\square} = 25$ b) $\square^3 = 8$ c) $2^{\square} = 16$

d) $\square^2 = 144$ e) $3^{\square} = 81$ f) $\square^7 = 1$

Complete the statements using either the word ***odd*** or ***even***:

a) If you **square an odd number**, the result is always _____.

b) If you **square an even number**, the result is always _____.

c) If you **cube an odd number**, the result is always _____.

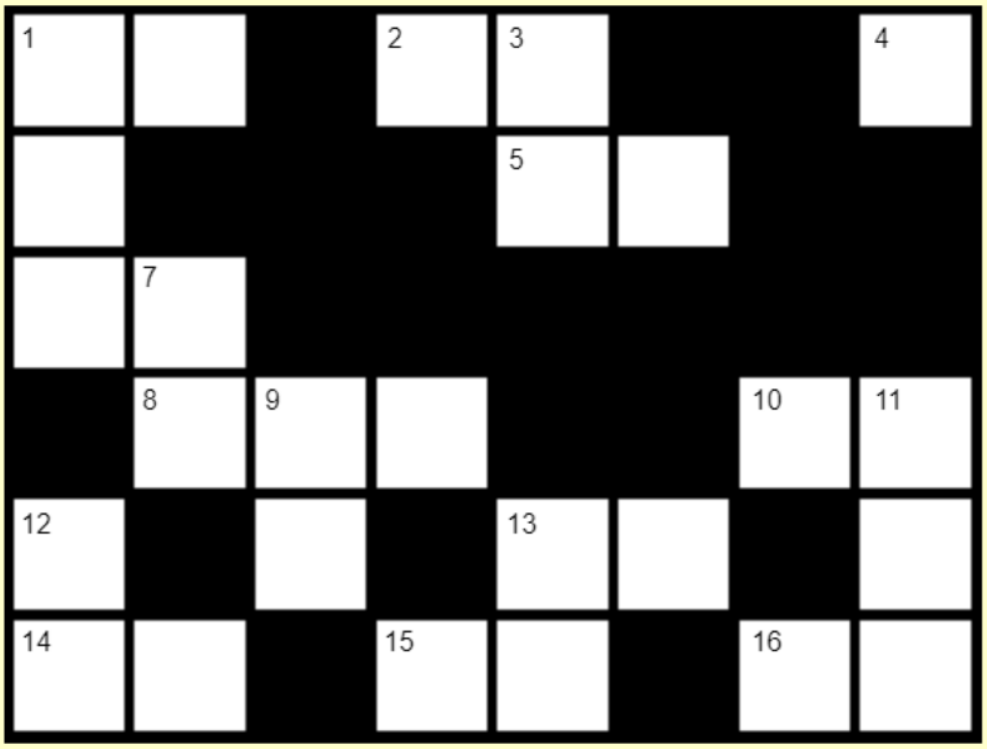
d) If you **cube an even number**, the result is always _____.

Problem solving!

Apply your core skills to the challenge questions below…

Squares & Cubes CrossNumber

Use the clues to work out which numbers go in the grid.



Down

1. 20^2
4. $\sqrt[3]{216}$
7. $\sqrt{121}$
9. Five squared
11. 12^2
12. $\sqrt{169}$

Across

1. The square of 7
2. 9 squared
5. 4^2
8. 5 cubed
10. Square root of 121
13. Three cubed
14. Six squared
15. Square root of 100
16. $\sqrt[3]{2744}$

HOMEWORK 2: FRACTION RECALL

Multiplying Fractions

STEP 1 STEP 2 STEP 3

$$\frac{3}{4} \times \frac{2}{5} = \frac{3 \times 2}{4 \times 5} = \frac{6}{20}$$

Simplify?

1) $\frac{1}{2} \times \frac{1}{3}$

2) $\frac{1}{8} \times \frac{2}{3}$

3) $\frac{4}{9} \times \frac{3}{5}$

4) $\frac{11}{12} \times \frac{8}{9}$

5) $\frac{2}{9} \times \frac{3}{5} \times \frac{6}{7}$

6) $\frac{2}{9} \times 4$

7) $\frac{9}{10} \times 22$

8) $\frac{8}{3} \times 54$

9) $1\frac{2}{5} \times \frac{2}{3}$

Problem solving!

Apply your core skills to the challenge questions below...

LOOK

N42a

Aled feeds his pet cat $\frac{3}{5}$ of a can of cat food each day.

How many cans of cat food should Aled buy each week?

.....

(3)

The next term of a sequence is found by multiplying the previous term by $\frac{2}{3}$

The first term in the sequence is $\frac{1}{5}$

Find the third term in the sequence.

.....

(3)

HOMEWORK 3: MATHSWATCH

For this week's homework, your teacher will set you a task to complete on the website Mathswatch. The task will be based on the content you have learnt over the past half term in your maths lessons. You can use the space on the next page to do any working out if you need to.

Below are the log in instructions you will need in order to access and complete this homework task.

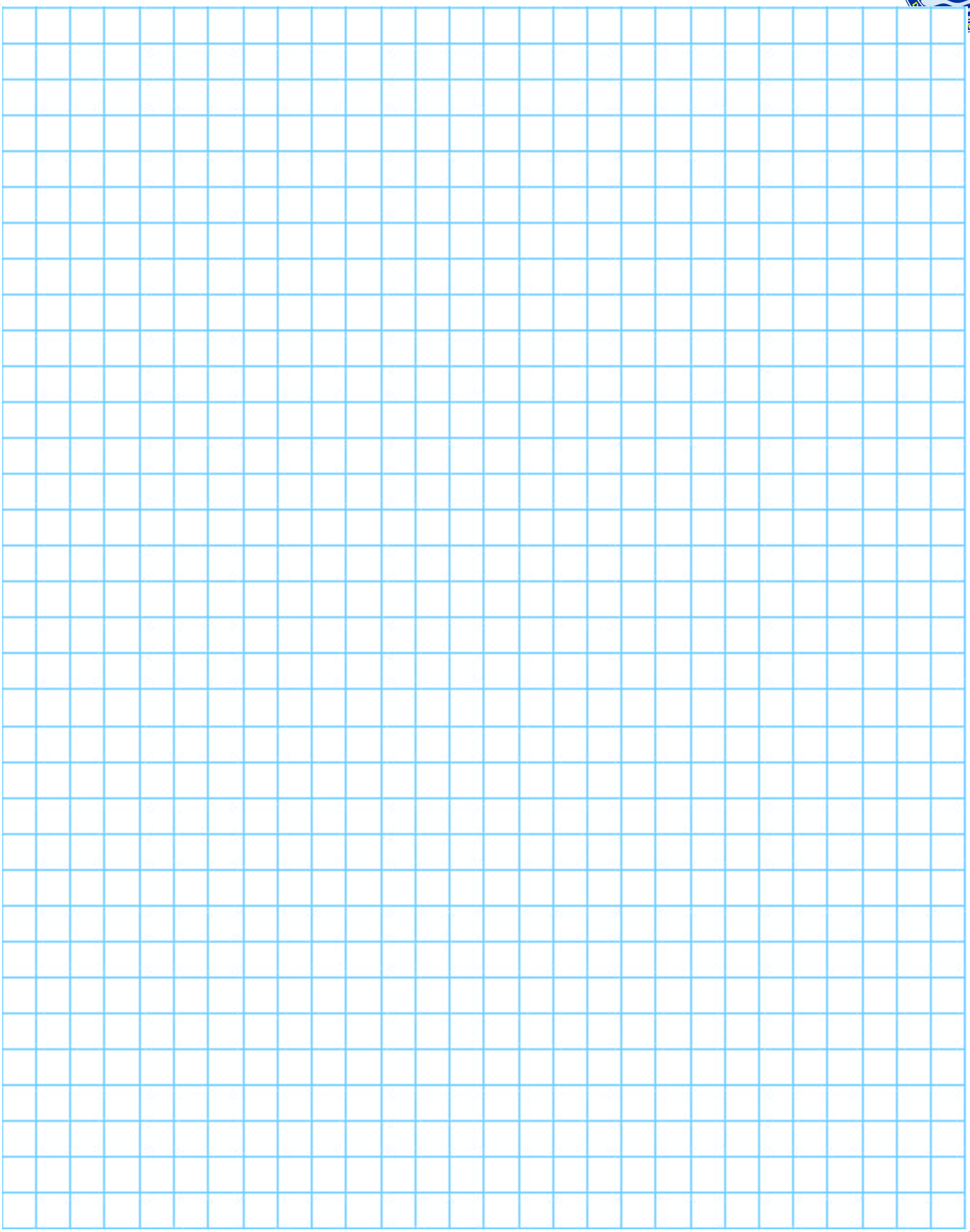
If you have any issues logging in, you must speak to your class teacher as soon as possible.

Username— firstnamelastname@benjamin

Password— your DOB (format: monthDYYYY)

If you need a printed copy of this homework task, make sure you speak to your class teacher before the due date and they will print a copy for you to complete.

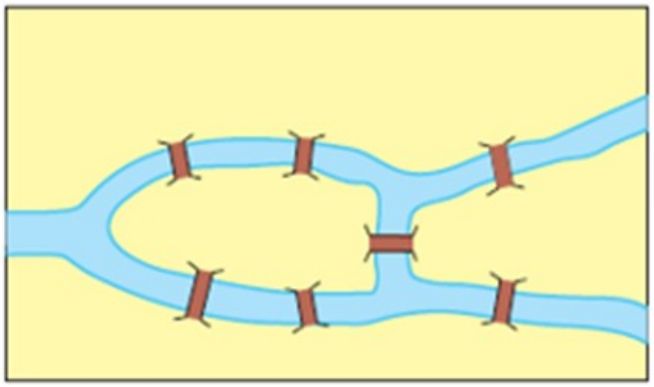
Additional working out space:



HOMEWORK 4: RESEARCH TASK

The Königsberg Problem

In the 18th century, the city of Königsberg (in Prussia) was split into parts by the river Pregel. There were seven bridges. The people of Königsberg tried to walk across all seven bridges without crossing the same bridge twice.



RESEARCH:

A famous mathematician, Leonhard Euler, examined the Königsberg problem.

(a) Find out when Euler lived.

(b) Find out what Euler said about the Königsberg problem.

(c) Königsberg is now called Kaliningrad and is in Russia. Find out how many of the seven bridges still exist.

Research task:

Present your findings for the research task in the box below.

You could draw a poster, write a list of notes, create a storyboard...the options are endless!

HOMEWORK 5: PERCENTAGES

To find 50%:	To find 10%:	To find 1%:	To find 20%:	To find 3%:
divide by 2	divide by 10	divide by 100	× 10% by 2	× 1% by 3

Work out:

a) 50% of 90 b) 10% of 95 c) 1% of 90

d) 1% of 240 e) 50% of 240 f) 1% of 35

g) 20% of 220 h) 5% of 220 i) 25% of 220

j) 3% of 220 k) 40% of 220 l) 80% of 220

Use the cards (once each) to complete these statements.

a) 50% of £9 = _____ b) 1% of £45 = _____

c) 10% of £450 = _____ d) 50% of _____ = £35

e) 10% of _____ = 7p f) 1% of _____ = 7p

45p	£7	£45	70p	£4.50	£70

LOOK
N24b

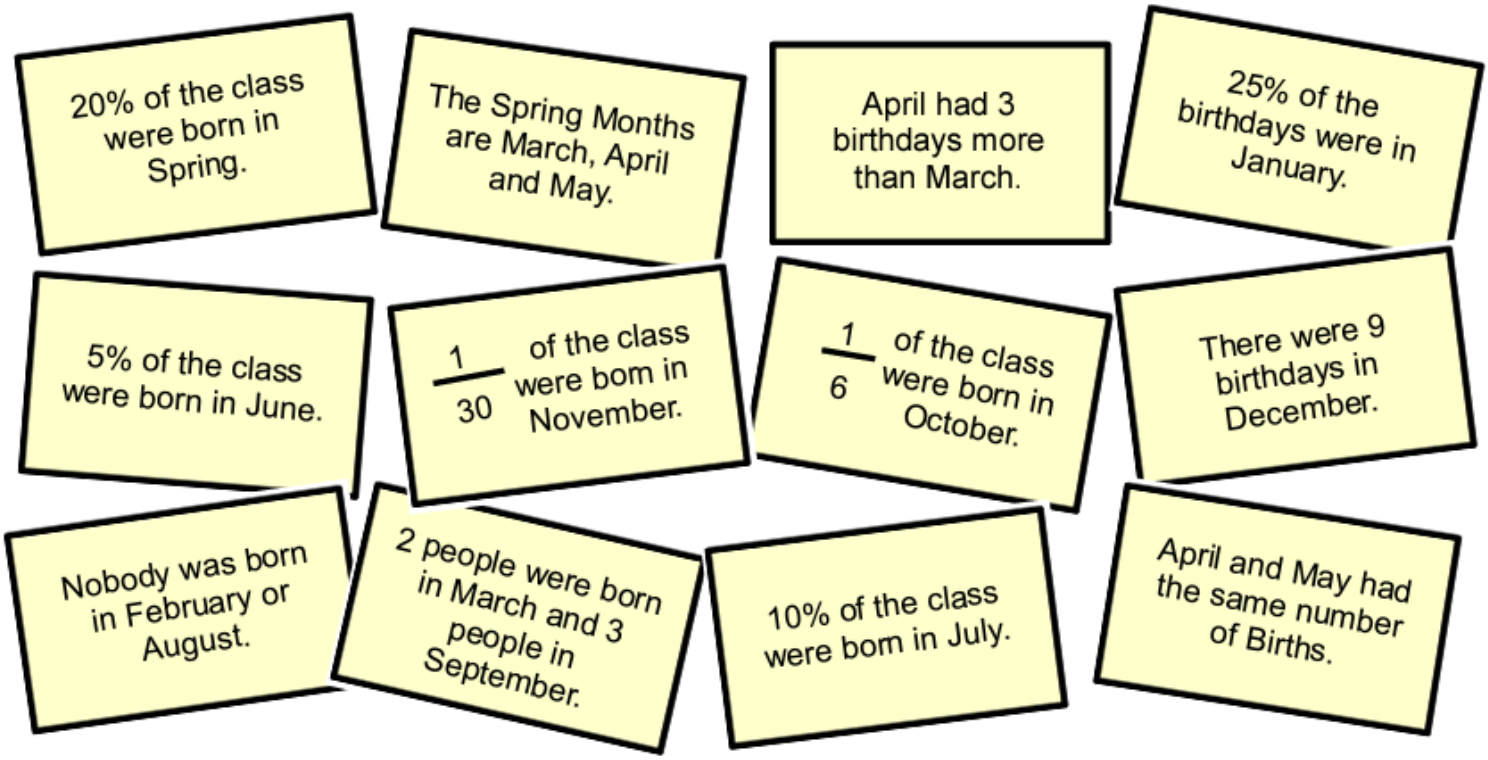
HW 5

Problem solving!

Apply your core skills to the challenge question below…

Who's Born When?

Miss Emily's school recorded their birthdays.
Can you use the clues below to workout how many children were born in each month?



Month	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
No. Children												

HOMEWORK 6: MATHSWATCH

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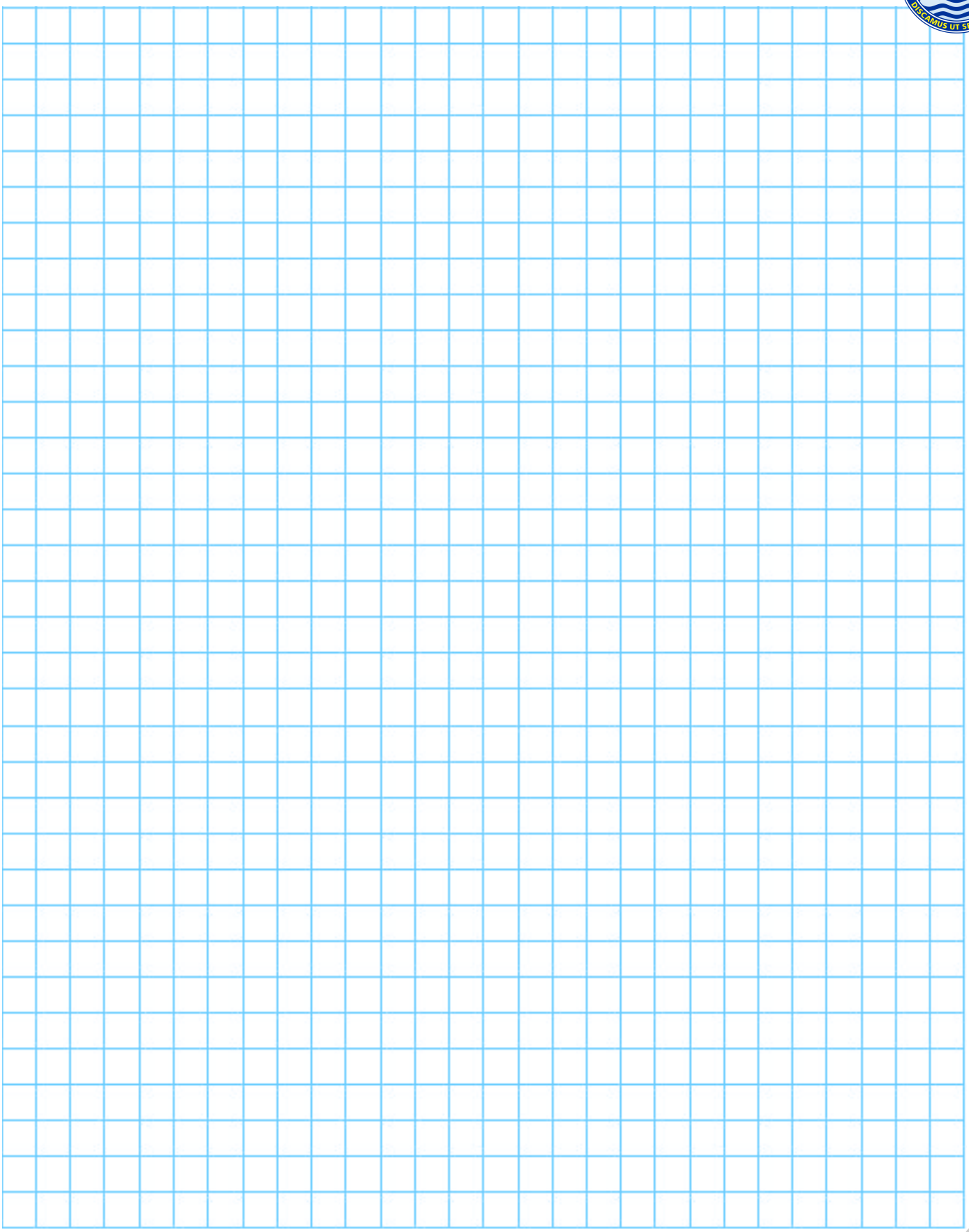
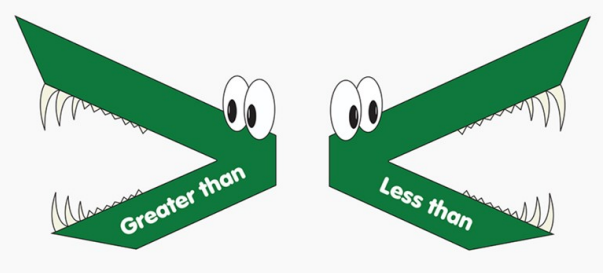


HOMEWORK 7: NUMERACY

< less than	> greater than



Section A

Statement	True or False
3 < 8	
2 > 10	
11 < 4	
4 > 3	
6 < 9	
13 < 14	

Statement	True or False
3 > 0	
6 > 2	
1 > 3	
6 < 2	
5 > 6	
0 < 10	

Section B

Statement	True or False
5.7 < 5.2	
4.9 > 4.1	
9.0 > 9.3	
8.4 < 4.8	
7.6 < 7.6	
7.2 > 7.0	

Statement	True or False
0.3 < 0.5	
0.6 > 0.7	
0.05 < 0.06	
0.35 > 0.3	
0.62 < 0.6	
0.01 < 0.1	

Section C

Statement	True or False
152.7 < 105.3	
25.9 > 56.7	
70.12 > 70.36	
5.42 < 4.57	
0.53 < 0.71	
0.24 < 0.78	

Statement	True or False
6.42 > 6.24	
71.17 > 71.71	
0.83 < 0.38	
0.41 > 0.14	
0.6 < 0.7	
0.554 > 0.545	

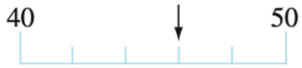
Problem solving!

Apply your core skills to the challenge questions below...

LOOK

N2b

Work out the value indicated by the arrow.

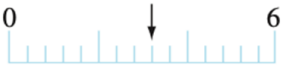
1 

2 

3 

4 

5 

6 

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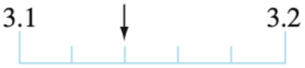
8 

9 

10 

11 

12 

13 

14 

15 

16 

17 

18 

HOMEWORK 8: DIVIDING FRACTIONS RECALL

- Keep the first fraction the same.
- Change the division to a multiplication.
- Flip the second fraction.

$$\frac{4}{11} \div \frac{5}{9} = \frac{4}{11} \times \frac{9}{5} = \frac{36}{55}$$

1) $\frac{1}{4} \div \frac{1}{3}$

2) $\frac{1}{7} \div \frac{1}{8}$

3) $\frac{2}{5} \div \frac{3}{4}$

4) $\frac{9}{10} \div \frac{3}{8}$

5) $\frac{4}{5} \div \frac{3}{8} \div \frac{2}{9}$

6) $\frac{6}{11} \div 4$

7) $\frac{7}{10} \div 9$

8) $\frac{9}{12} \div 54$

9) $1\frac{1}{10} \div \frac{2}{5}$

Problem solving!

Apply your core skills to the challenge questions below...

LOOK

N42b

A) $\frac{1}{6} \div \frac{1}{8} =$

B) $\frac{2}{3} \div \frac{1}{5} =$

C) $\frac{1}{4} \div \frac{2}{6} =$

D) $\frac{1}{2} \div \frac{4}{5} =$

E) $\frac{1}{3} \div \quad = 1$

F) $\frac{5}{3} \div \frac{1}{9} =$

G) $\frac{2}{3} \div \quad = \frac{2}{5}$

H) $\frac{3}{2} \div \frac{5}{2} =$

CHALLENGE! *(Hint: you may need to use the inverse)*

$1\frac{1}{4} \div \quad = \frac{5}{3}$

$2\frac{1}{3} \div \quad = \frac{1}{3}$

$1\frac{5}{6} \div 1\frac{1}{8} =$

HOMEWORK 9: MATHSWATCH

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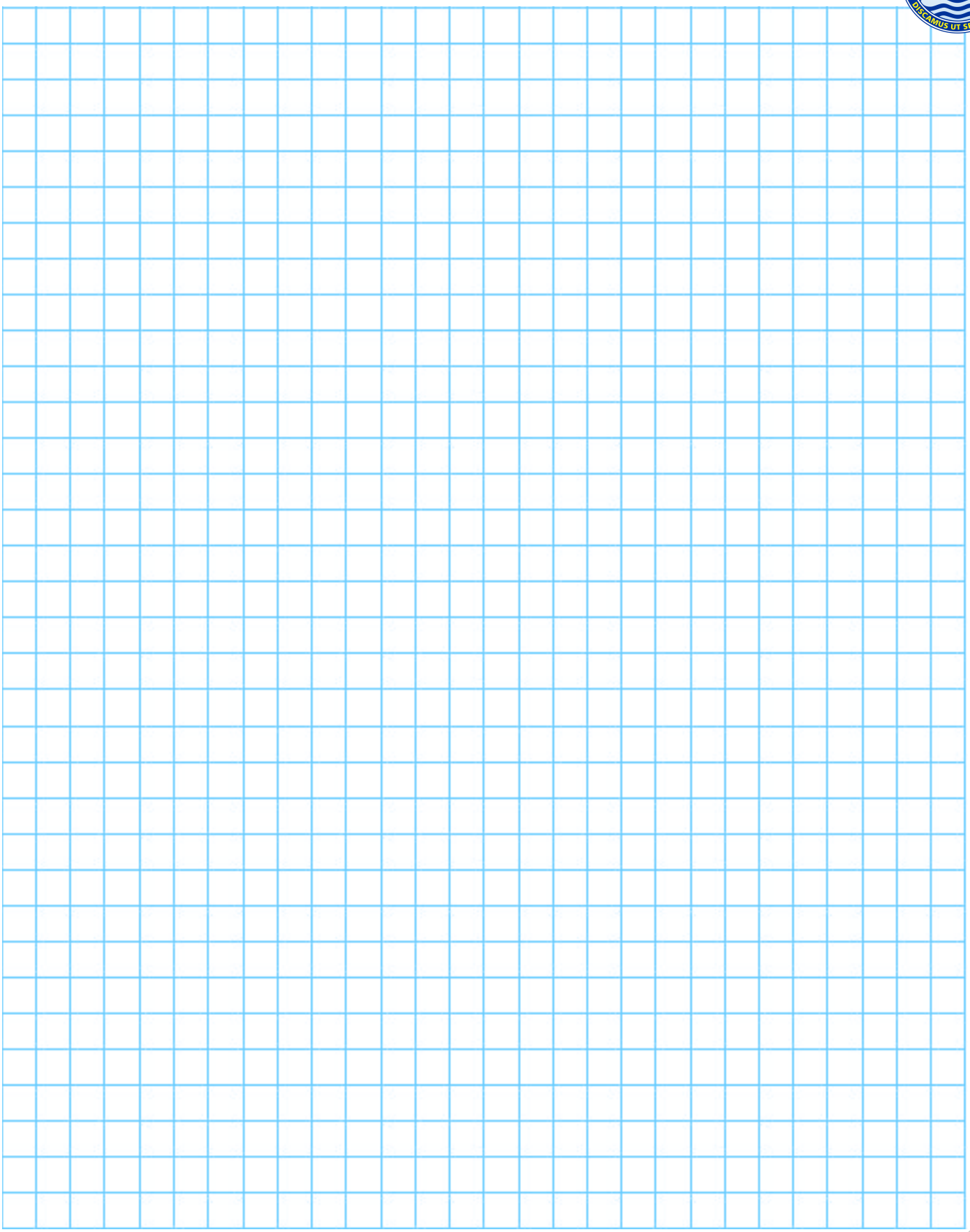
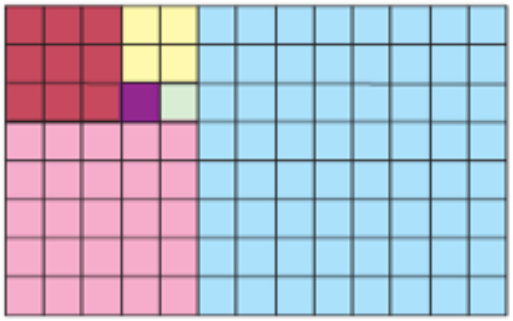


HOMEWORK 10: RESEARCH TASK

The Fibonacci sequence



This rectangle is made from six squares drawn on centimetre squared paper. Write down the length of one side in each of the squares.

Can you arrange the numbers to make a pattern?

What would be the next number in your pattern?

Write down a rule for your pattern.

Write down your answers for the questions above here:

Fibonacci was born in Pisa, Italy. He lived in the 13th century.
He worked on the pattern 1, 1, 2, 3, 5, 8, …

Each number is found by adding the two terms immediately before it.

The next number is 13 from 5 + 8.

Fibonacci found that these numbers helped to explain things to do with spirals in flowers, shells, the breeding of rabbits, pine cones, the family tree of honeybees and many other cases.

RESEARCH:

(a) Find out more about Fibonacci's life.

(b) List as many things as you can which are connected to Fibonacci numbers.

Research task:

Present your findings for the research task in the box below.

HOMEWORK 11: PERCENTAGES 2

- Find the percentage of the amount
- To increase, add it on
- To decrease, take it off

Increase the following amounts by...	*25%*
£20	
£16	
£32	
£60	
£400	
£2700	
£18'500	

Decrease the following amounts by...	*20%*
£30	
£14	
£22	
£70	
£800	
£3400	
£26'200	

LOOK
R9

HW 11

Problem solving!

Apply your core skills to the challenge questions below...

LOOK
R9a

1: Last year, there were 20 students in a class.
This year, there are 30% more students.
How many students are in the class this year?

2: A TV normally costs £520.
In a sale, all prices are reduced by 10%
Calculate the sale price of the TV

3: Over the past 10 years, the population of a town has increased by 25%
The population of the town 10 years ago was 18000
What is the population of the town now?

4: A standard bag of flour contains 600g of flour.
A special edition bag contains 35% more flour.
How much flour is in the special edition bag?

5: Richard owns a coffee shop.
In February, 4500 hot chocolates were sold.
The number of hot chocolates sold in March was 3% less.
How many hot chocolates are sold in March?

HOMEWORK 12: MATHSWATCH

For this week's homework, your teacher will set you a task to complete on the website Mathswatch. The task will be based on the content you have learnt over the past half term in your maths lessons. You can use the space on the next page to do any working out if you need to.

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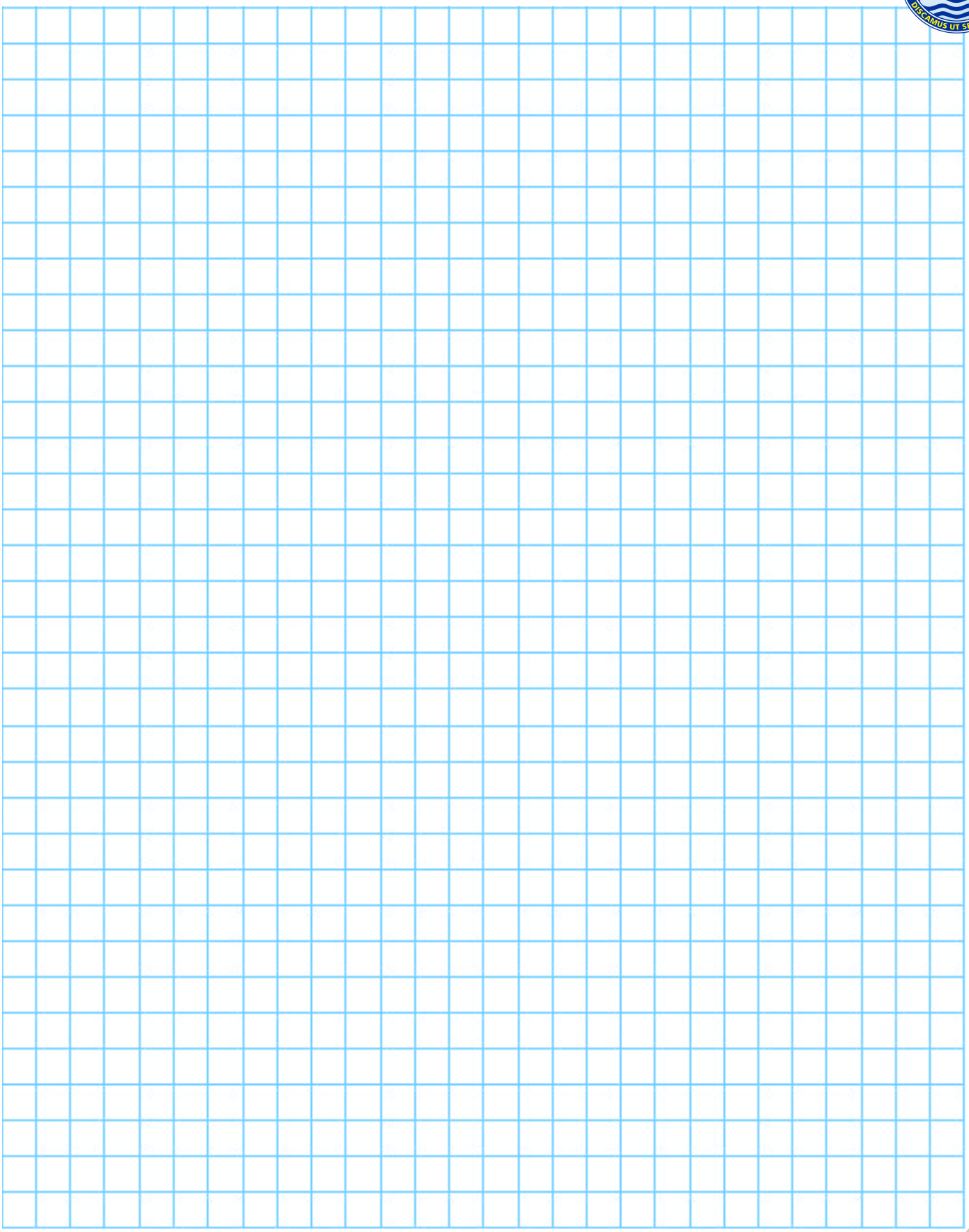

Work out the missing values:

a) $5^{\square} = 25$ 2

b) $\square^3 = 8$ 2

c) $2^{\square} = 16$ 4

d) $\square^2 = 144$ 12

e) $3^{\square} = 81$ 4

f) $\square^7 = 1$ 1

Complete the statements using either the word ***odd*** or ***even***:

a) If you **square an odd number**, the result is always odd.

b) If you **square an even number**, the result is always even.

c) If you **cube an odd number**, the result is always odd.

d) If you **cube an even number**, the result is always even.

Which of the following are square numbers? Choose all that apply.

10	16	9	27	3	8	48	1	55	36

Which of the following are cube numbers? Choose all that apply.

4	1	100	9	1000	6	64	125	27	81

Find:

a) a square number between 20 and 30 25

b) a cube number less than 5 1

c) an odd square number between 50 and 100 81

d) a cube number that ends in 7 27

Skill Questions	
Multiply the fractions below. Express your answers in lowest terms: **1)** $\frac{1}{2} \times \frac{1}{3}$ **2)** $\frac{1}{8} \times \frac{2}{3}$ **3)** $\frac{4}{9} \times \frac{3}{5}$ **4)** $\frac{11}{12} \times \frac{8}{9}$ **5)** $\frac{2}{9} \times \frac{3}{5} \times \frac{6}{7}$ **6)** $\frac{2}{9} \times 4$ **7)** $\frac{9}{10} \times 22$ **8)** $\frac{8}{3} \times 54$ **9)** $1\frac{2}{5} \times \frac{2}{3}$	**1)** $\frac{1}{6}$ **2)** $\frac{1}{12}$ **3)** $\frac{4}{15}$ **4)** $\frac{22}{27}$ **5)** $\frac{4}{35}$ **6)** $\frac{8}{9}$ **7)** $\frac{99}{5}$ **8)** 144 **9)** $\frac{14}{15}$

ANSWERS—WEEK 2

The next term of a sequence is found by multiplying the previous term by $\frac{2}{3}$

The first term in the sequence is $\frac{1}{5}$

Find the third term in the sequence.

$\frac{1}{5} \times \frac{2}{3} = \frac{2}{15}$

$\frac{2}{15} \times \frac{2}{3} = \frac{4}{45}$

$\frac{4}{45}$

.....

(3)

Aled feeds his pet cat $\frac{3}{5}$ of a can of cat food each day.

How many cans of cat food should Aled buy each week?

$\frac{3}{5} \times \frac{7}{1} = \frac{21}{5}$

$= 4\frac{1}{5}$

5 cans

.....

(3)

Work out:

a) 50% of 90 45

b) 10% of 95 9.5

c) 1% of 90 0.9

d) 1% of 240 2.4

e) 50% of 240 120

f) 1% of 35 0.35

g) 20% of 220 44

h) 5% of 220 11

i) 25% of 220 55

j) 3% of 220 6.6

k) 40% of 220 88

l) 80% of 220 176

Use the cards (once each) to complete these statements.

a) 50% of £9 = £4.50

b) 1% of £45 = 45p

c) 10% of £450 = £45

d) 50% of £70 = £35

e) 10% of 70p = 7p

f) 1% of £7 = 7p

45p	£7	£45	70p	£4.50	£70

Answer Key

Miss Emily's school recorded their birthdays.
Can you use the clues below to workout how many children were born in each month?

Month	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
No. Children	15	0	2	5	5	3	6	0	3	10	2	9

Section A

Statement	True or False
3 < 8	TRUE
2 > 10	FALSE
11 < 4	FALSE
4 > 3	TRUE
6 < 9	TRUE
13 < 14	TRUE

Statement	True or False
3 > 0	TRUE
6 > 2	TRUE
1 > 3	FALSE
6 < 2	FALSE
5 > 6	FALSE
0 < 10	TRUE

Section B

Statement	True or False
5.7 < 5.2	FALSE
4.9 > 4.1	TRUE
9.0 > 9.3	FALSE
8.4 < 4.8	FALSE
7.6 < 7.6	FALSE
7.2 > 7.0	TRUE

Statement	True or False
0.3 < 0.5	TRUE
0.6 > 0.7	FALSE
0.05 < 0.06	TRUE
0.35 > 0.3	TRUE
0.62 < 0.6	FALSE
0.01 < 0.1	TRUE

Section C

Statement	True or False
152.7 < 105.3	FALSE
25.9 > 56.7	FALSE
70.12 > 70.36	FALSE
5.42 < 4.57	FALSE
0.53 < 0.71	TRUE
0.24 < 0.78	TRUE

Statement	True or False
6.42 > 6.24	TRUE
71.17 > 71.71	FALSE
0.83 < 0.38	FALSE
0.41 > 0.14	TRUE
0.6 < 0.7	TRUE
0.554 > 0.545	TRUE

1. 46	**2.** 2.6	**3.** 14.8	**4.** 15.2	**5.** 0.2	**6.** 3.2
7. 7	**8.** 5.2	**9.** 3.14	**10.** 0.02	**11.** 1.02	**12.** 0.8
13. 0.24	**14.** 120	**15.** 1.8	**16.** 16	**17.** 88	**18.** 4.35

Divide the fractions below. Express your answers in lowest terms:	
1) $\frac{1}{4} \div \frac{1}{3}$	**1)** $\frac{3}{4}$
2) $\frac{1}{7} \div \frac{1}{8}$	**2)** $\frac{8}{7}$
3) $\frac{2}{5} \div \frac{3}{4}$	**3)** $\frac{8}{15}$
4) $\frac{9}{10} \div \frac{3}{8}$	**4)** $\frac{12}{5}$
5) $\frac{4}{5} \div \frac{3}{8} \div \frac{2}{9}$	**5)** $\frac{48}{5}$
6) $\frac{6}{11} \div 4$	**6)** $\frac{3}{22}$
7) $\frac{7}{10} \div 9$	**7)** $\frac{7}{90}$
8) $\frac{9}{12} \div 54$	**8)** $\frac{1}{72}$
9) $1\frac{1}{10} \div \frac{2}{5}$	**9)** $\frac{11}{4}$

ANSWERS—WEEK 8

A) $\frac{1}{6} \div \frac{1}{8} = \frac{4}{3}$

B) $\frac{2}{3} \div \frac{1}{5} = \frac{10}{3}$

C) $\frac{1}{4} \div \frac{2}{6} = \frac{3}{4}$

D) $\frac{1}{2} \div \frac{4}{5} = \frac{5}{8}$

E) $\frac{1}{3} \div \frac{1}{3} = 1$

F) $\frac{5}{3} \div \frac{1}{9} = 15$

G) $\frac{2}{3} \div \frac{5}{3} = \frac{2}{5}$

H) $\frac{3}{2} \div \frac{5}{2} = \frac{3}{5}$

$1\frac{1}{4} \div \frac{3}{4} = \frac{5}{3}$

$2\frac{1}{3} \div 7 = \frac{1}{3}$

$1\frac{5}{6} \div 1\frac{1}{8} = 1\frac{34}{54}$

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EXTRA SUPPORT

If you need help with completing your homework, please use the Mathswatch clips in the LOOK boxes first. If you are still stuck, speak to your class teacher.

If you need to contact the Head of Maths regarding any worries or concerns, you can contact Miss Pankhurst at:

j.pankhurst@benjaminbritten.school

RESOURCES PROVIDED BY:

Numeracy Ninjas
Mr Carter Maths
Miss B's Resources
NRich
Worksheet Works
10Ticks