Benjamin Britten Academy of Music and Mathematics

MATHEMATICS HOMEWORK BOOKLET

Year 8 Book A

SPRING TERM

NAME:

CONTENTS

WEEK	HOMEWORK TITLE
1	Numeracy
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3	Mathswatch
4	Research Task
5	Percentages
6	Mathswatch
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8	Dividing Fractions Recall
9	Mathswatch
10	Research Task
11	Percentages 2
12	Mathswatch

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

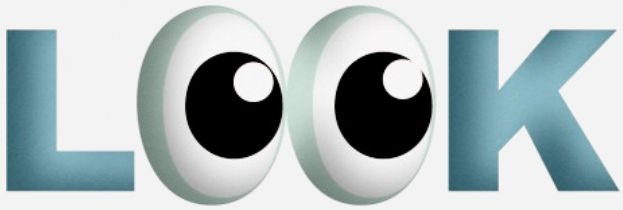
Password—your DOB (format: monthDYYYY)

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

Squaring means to multiply something by itself.
Square root is the inverse (opposite) of squaring.

Square —> $3^2 = 3 \times 3 = 9$

Cube —> $2^3 = 2 \times 2 \times 2 = 8$

Remember.. negative × negative=positive

Example:
$(-5)^2$
$-5 \times -5 = 25$

Bronze	Silver	Gold
Q1) 4^2	Q1) $\sqrt{25}$	Q1) $8^2 + \sqrt[3]{8}$
Q2) 13^2	Q2) $\sqrt{81}$	Q2) $5^2 + \sqrt[3]{216}$
Q3) $(-10)^2$	Q3) $-\sqrt{121}$	Q3) $(-14)^2 + \sqrt[3]{1}$
Q4) $(-2)^2$	Q4) $-\sqrt{49}$	Q4) $(-13)^2 + \sqrt[3]{27}$
Q5) 4^3	Q5) $\sqrt[3]{8}$	Q5) $6^3 + \sqrt{169}$
Q6) 5^3	Q6) $\sqrt[3]{216}$	Q6) $2^3 + \sqrt{36}$
Q7) $(-7)^3$	Q7) $-\sqrt[3]{64}$	Q7) $(-4)^3 + \sqrt{100}$
Q8) $(-3)^3$	Q8) $-\sqrt[3]{27}$	Q8) $(-7)^3 + \sqrt{4}$

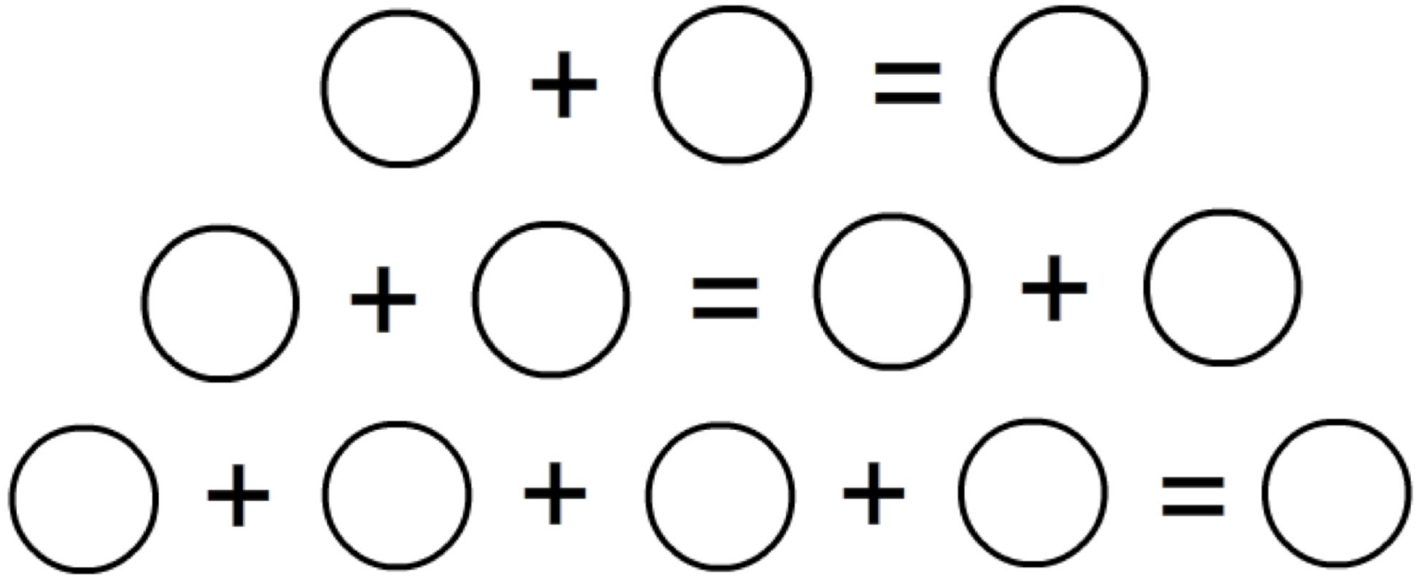
Problem solving!

Apply your core skills to the challenge questions below…

Hint: start by listing the square and cube numbers that are less than or equal to 100.
This can also be written as $x \leq 100$.

Square & cube numbers puzzle

Using only square and cube numbers less than or equal to 100, can you fill in the circles to make these sums true? You can only use each number once and you must use all the numbers.



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

10) $1\frac{7}{8} \times 1\frac{1}{3}$

11) $3\frac{2}{9} \times 6\frac{5}{6}$

12) $1\frac{3}{11} \times 7\frac{2}{9} \times 6\frac{2}{3}$

Problem solving!

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

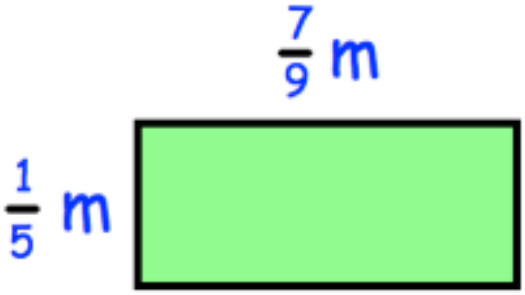
LOOK

N42a

Alexis has a pet dog, Maxi.

Each day Maxi eats $\frac{2}{3}$ of a can of dog food.

How many cans of dog food should Alexis buy to last 12 days?



Find the area of this rectangle

HOMEWORK 3: MATHSWATCH

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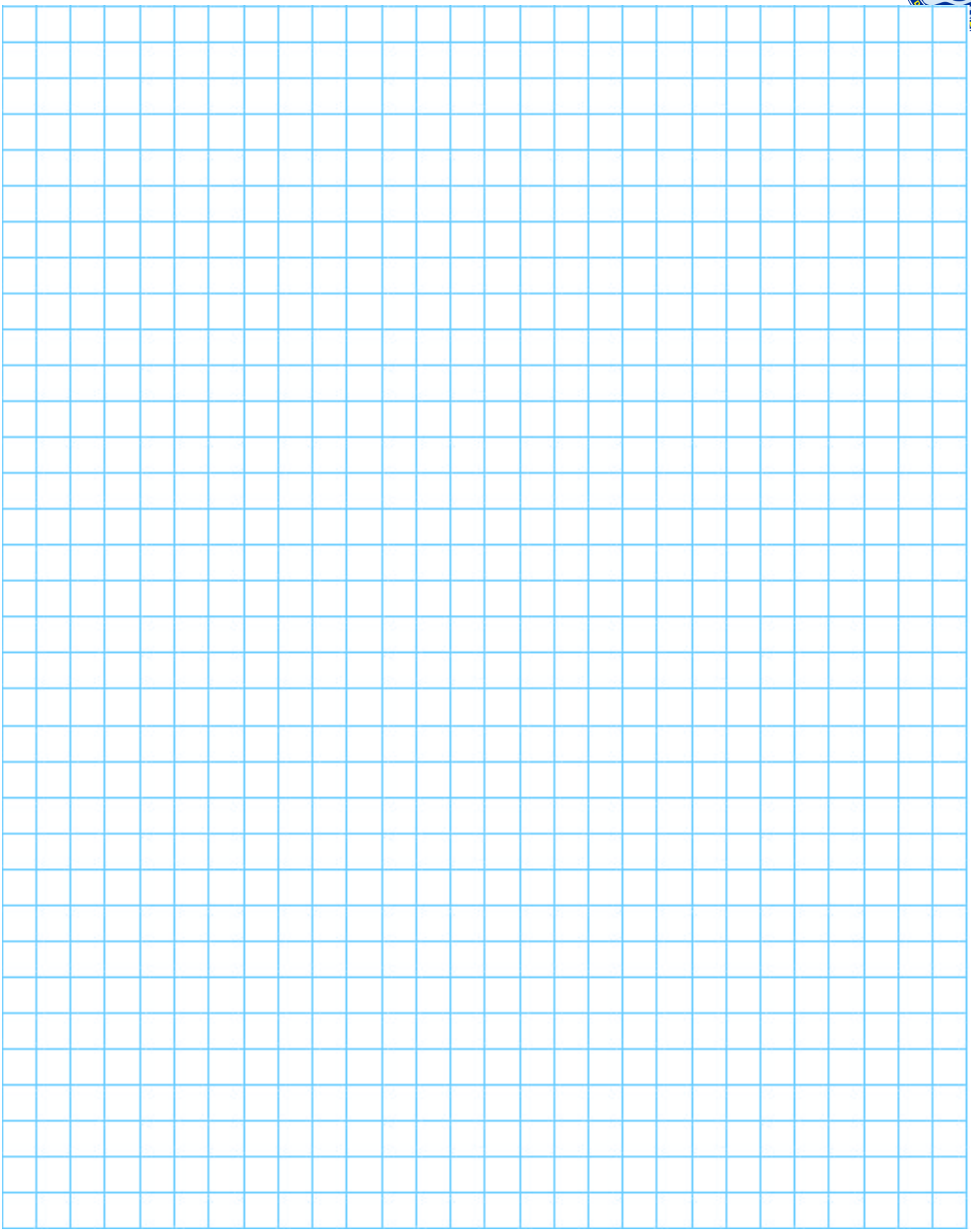
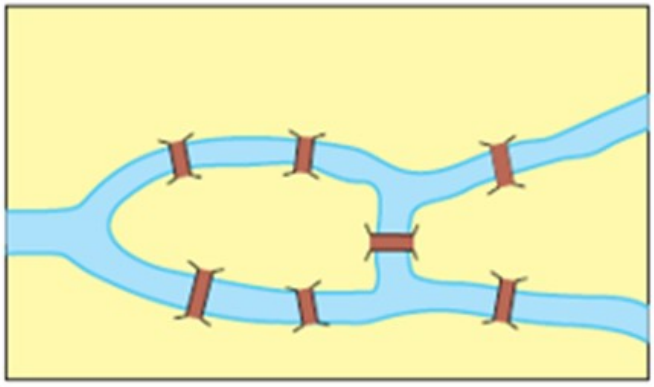
Additional working out space:



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

Section A

Amount	£120	£16	£4.40
10%			
5%			
20%			
50%			
25%			
1%			

Section B

1) Find 10% of £14 =
2) Find 20% of £50 =
3) Find 5% of £28 =
4) Find 25% of £8 =
5) Find 1% of £130 =
6) Find 20% of £6 =
7) Find 10% of £33 =
8) Find 100% of £11=
9) Find 50% of £54 =
10) Find 1% of £270 =
11) Find 50% of £12.80 =
12) Find 5% of £6.40 =
13) Find 1% of £199 =
14) Find 100% of £7.21 =
15) Find 25% of £16.80 =
16) Find 20% of £8.90 =
17) Find 10% of £0.36 =
18) Find 100% of £0.99 =
19) Find 150% of £1.60 =
20) Find 110% of £2.20 =

Problem solving!

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

1. Calculate 80% of 30

.....

(2)

---

2. A bag of sugar contains 420g.
A special offer packet contains an extra 15%.

Work out how much extra sugar is in the special offer packet.

.....g

(2)

3. A new car is priced at £7500.
In a sale it is reduced by 20%.

Calculate the reduction in price.

£.....

(2)

HOMEWORK 6: MATHSWATCH

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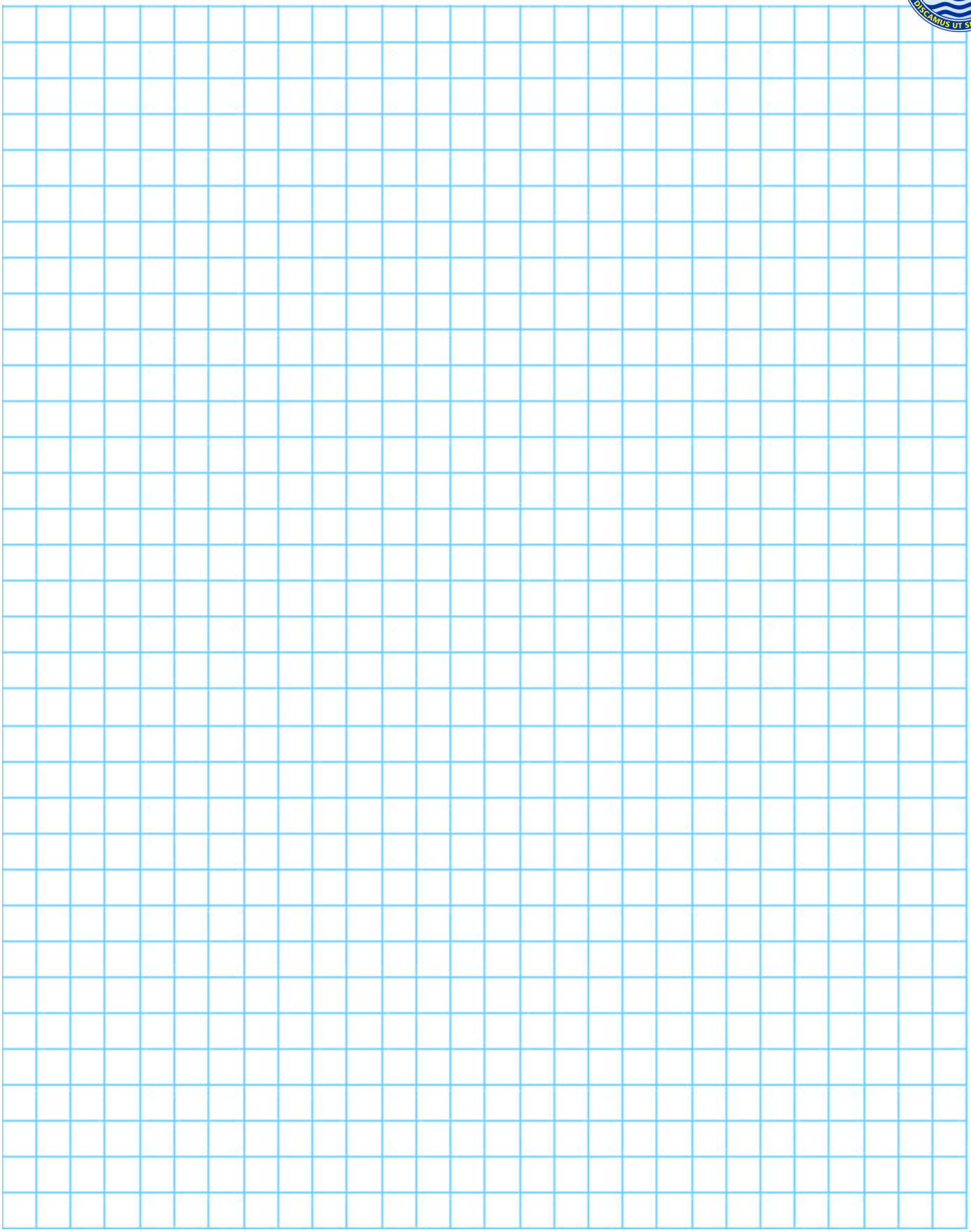
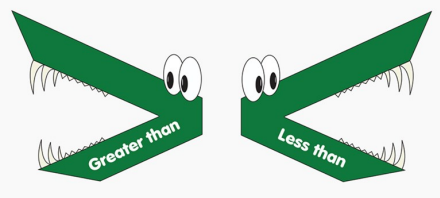


HOMEWORK 7: NUMERACY

< 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	

Section D

Statement	True or False
0.5 ___ 0.6	True
1.3 ___ 1.4	True
2.11 ___ 2.09	True
0.25 ___ 0.23	True
0.46 ___ 0.47	True
0.031 ___ 0.032	True
0.776 ___ 0.775	True

Statement	True or False
0.98 ___ 0.951	False
2.222 ___ 2.002	True
3.09 ___ 9.03	False
	True
	True
	False
	False

Problem solving!

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

LOOK

N2b

Work out the value indicated by the arrow.

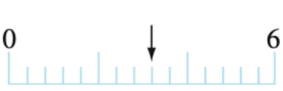
1 

2 

3 

4 

5 

6 

7 

8 

9 

10 

11 

12 

13 

14 

15 

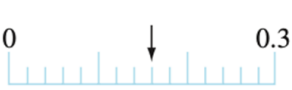
16 

17 

18 

19 

20 

21 

22 

23 

24 

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

10) $3\frac{5}{8} \div 7$

11) $4\frac{7}{10} \div 3\frac{3}{5}$

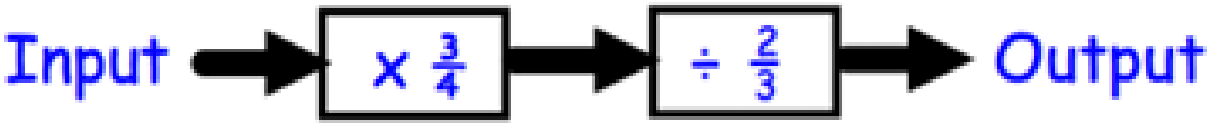
12) $4\frac{3}{10} \div 2\frac{3}{8} \div 1\frac{1}{4}$

Problem solving!

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

LOOK

N42b



(a) Find the output, if the input is 2.

.....

(3)

(b) Find the input, if the output is $\frac{1}{2}$

.....

(3)

HOMEWORK 9: MATHSWATCH

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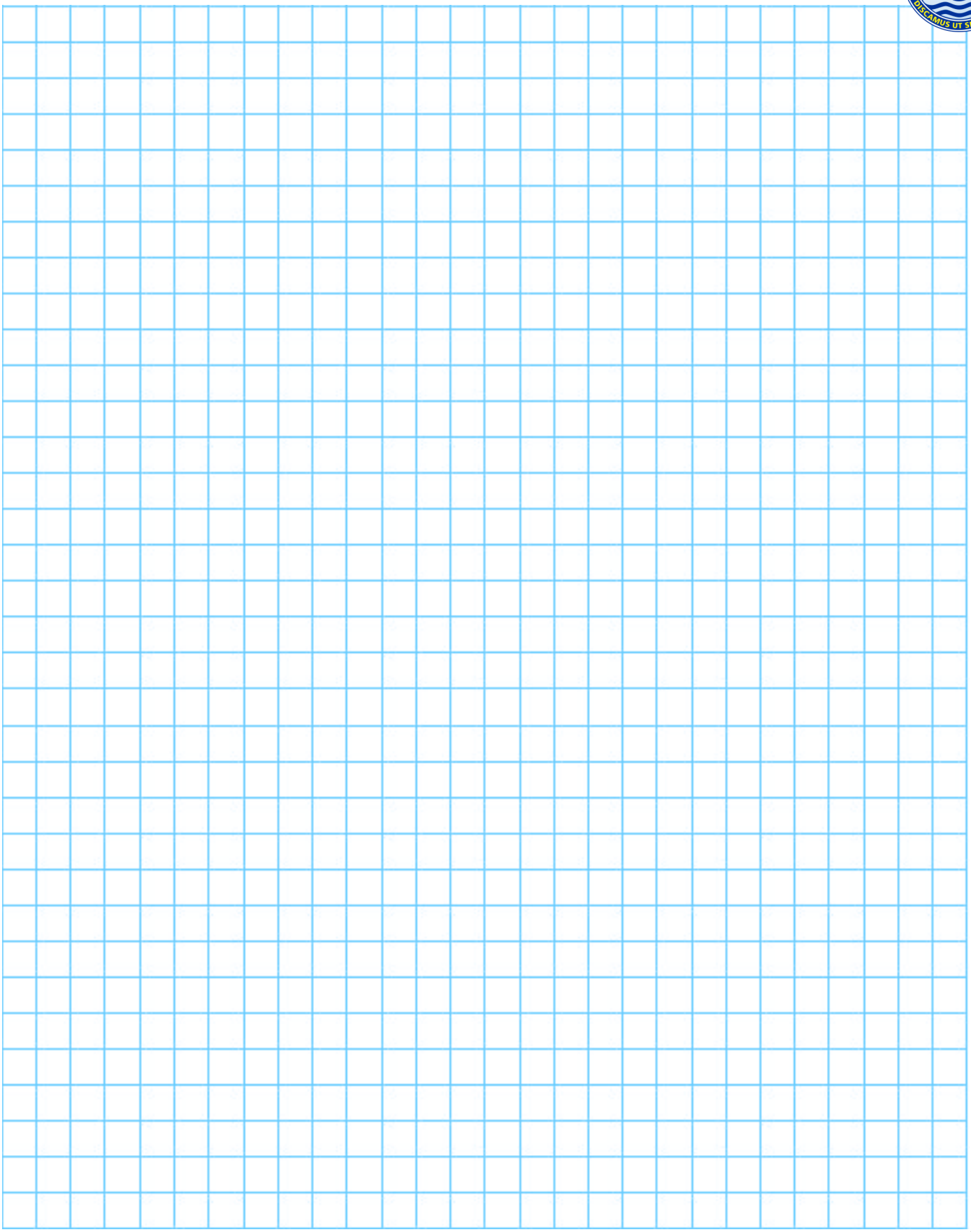
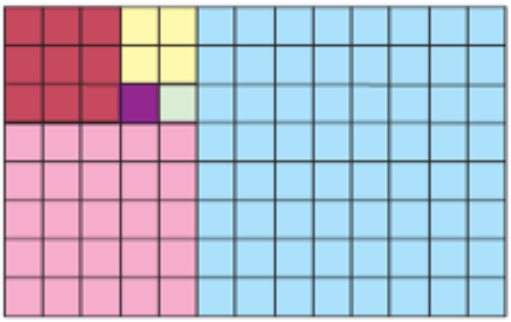


HOMEWORK 10: RESEARCH TASK

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%*	*1%*
£20		
£16		
£32		
£60		
£400		
£2700		
£18'500		

Decrease the following amounts by...	*20%*	*2.5%*
£30		
£14		
£22		
£70		
£800		
£3400		
£26'200		

LOOK
R9

Problem solving!

Apply your core skills to the challenge questions below…

Oliver's salary is £18,000 and he is due to get an increase of 4%.
How much will this increase be?

£.....

(2)

A new TV is priced at £320
In a sale it is reduced by 45%

Calculate the sale price

£.....

(3)

Joanne sees this special offer in a shop.

Special Offer	
iPod	£189
Headphones	£25

Buy both items and receive a 4% discount

Joanne buys both items.

How much does she pay?

£.....

(3)

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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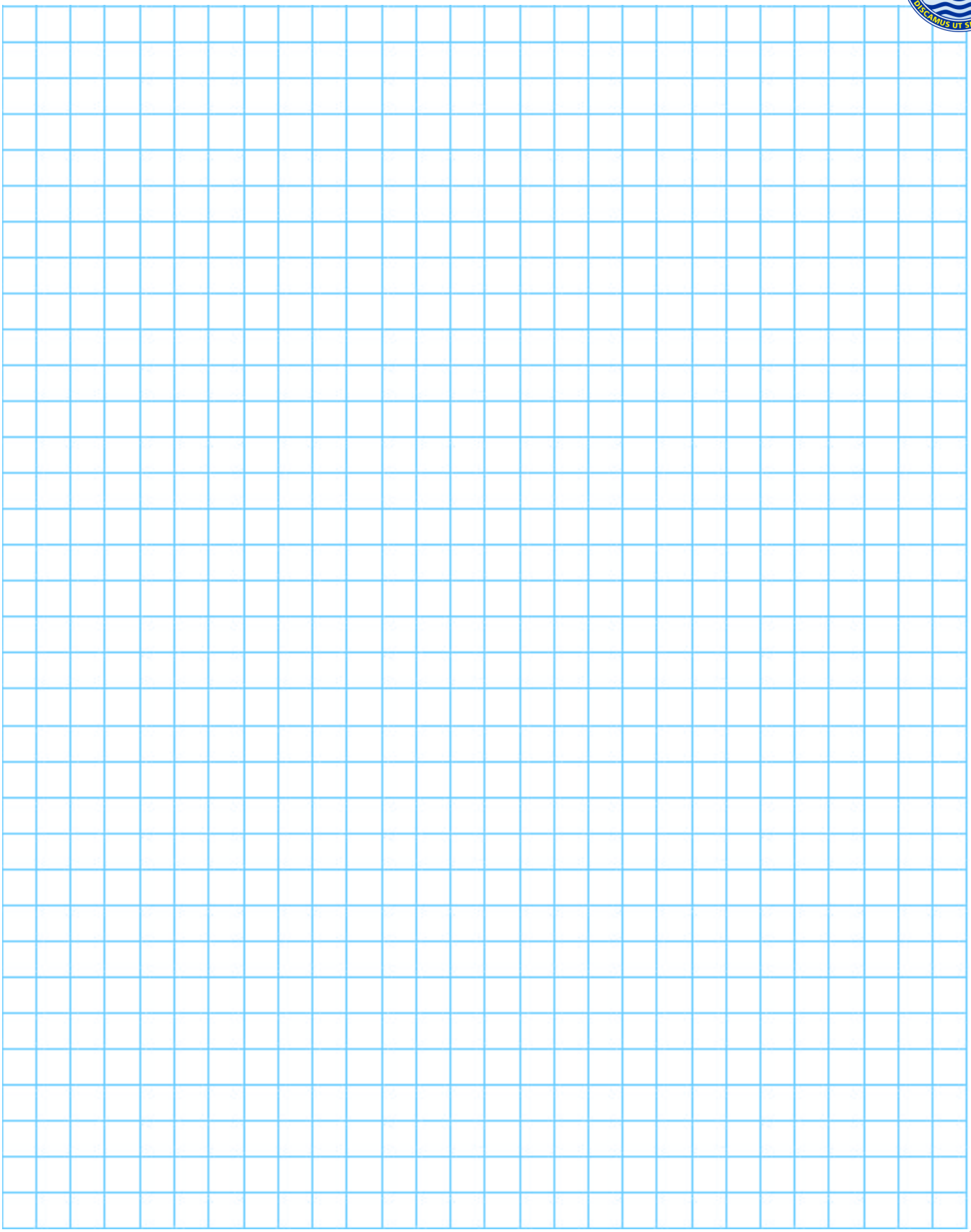


ANSWERS—WEEK 1

Bronze

Q1) 16

Q2) 169

Q3) 100

Q4) 4

Q5) 64

Q6) 125

Q7) -343

Q8) -27

Silver

Q1) 5

Q2) 9

Q3) -11

Q4) -7

Q5) 2

Q6) 6

Q7) -4

Q8) -3

Gold

Q1) 66

Q2) 31

Q3) 197

Q4) 172

Q5) 229

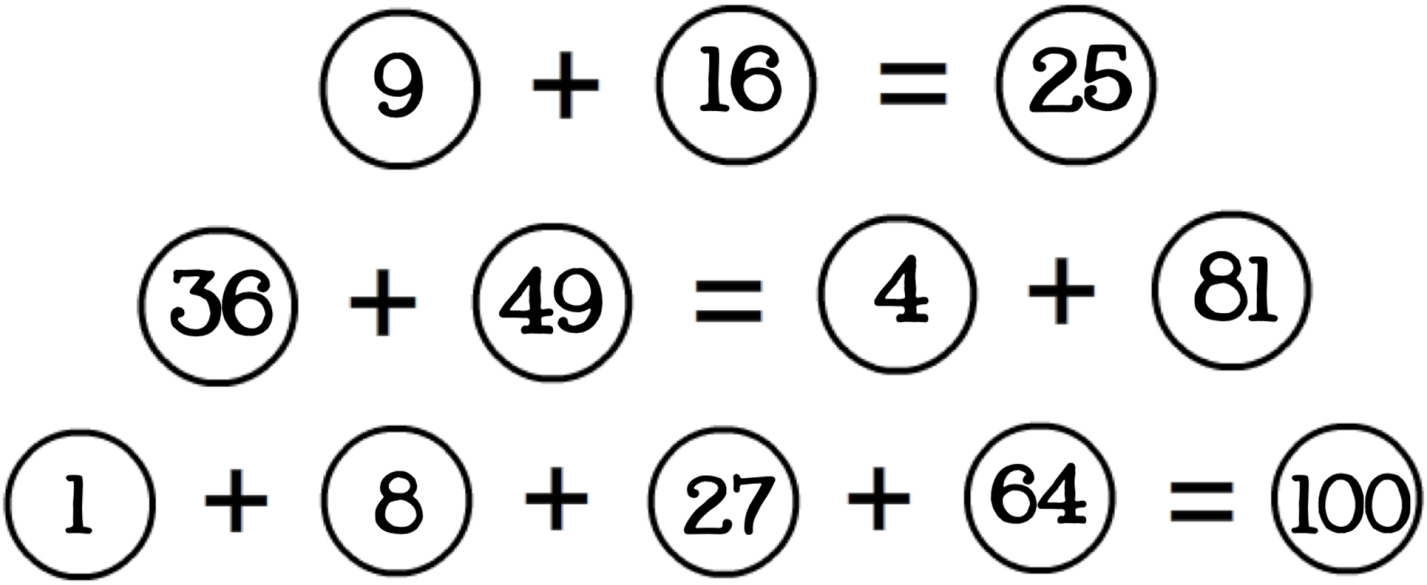
Q6) 14

Q7) -54

Q8) -341

Square & cube numbers puzzle

Using only square and cube numbers less than or equal to 100, can you fill in the circles to make these sums true? You can only use each number once and you must use all the numbers.



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)** $1\frac{2}{5} \times \frac{2}{3}$ **10)** $1\frac{7}{8} \times 1\frac{1}{3}$ **11)** $3\frac{2}{9} \times 6\frac{5}{6}$ **12)** $1\frac{3}{11} \times 7\frac{2}{9} \times 6\frac{2}{3}$	**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)** $\frac{14}{15}$ **10)** $\frac{5}{2}$ **11)** $\frac{1189}{54}$ **12)** $\frac{18200}{297}$

ANSWERS—WEEK 2

Alexis has a pet dog, Maxi.

Each day Maxi eats $\frac{2}{3}$ of a can of dog food.

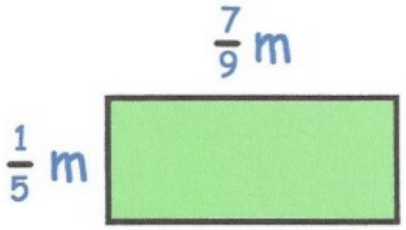
How many cans of dog food should Alexis buy to last 12 days?

$\frac{2}{3} \times 12 = \frac{24}{3} = 8$

or

$\frac{2}{3}$ of $12 = 8$

8 cans



Find the area of this rectangle

$\frac{1}{5} \times \frac{7}{9} = \frac{7}{45}$

$\frac{7}{45}$ m²

Section A

Amount	£120	£16	£4.40
10%	£12	£1.60	£0.44
5%	£6	£0.80p	£0.22
20%	£24	£3.20	£0.88
50%	£60	£8	£2.20
25%	£30	£4	£1.10
1%	£1.20	£0.16	£0.04

Section B

1) Find 10% of £14 = £1.40
2) Find 20% of £50 = £10
3) Find 5% of £28 = £1.40
4) Find 25% of £8 = £2
5) Find 1% of £130 = £1.30
6) Find 20% of £6 = £1.20
7) Find 10% of £33 = £3.30
8) Find 100% of £11= £11
9) Find 50% of £54 = £27
10) Find 1% of £270 = £2.70

11) Find 50% of £12.80 = £6.40
12) Find 5% of £6.40 = £0.32
13) Find 1% of £199 = £1.99
14) Find 100% of £7.21 = £7.21
15) Find 25% of £16.80 = £4.20
16) Find 20% of £8.90 = £1.78
17) Find 10% of £0.36 = £0.04
18) Find 100% of £0.99 = £0.99
19) Find 150% of £1.60 = £2.40
20) Find 110% of £2.20 = £2.42

1. Calculate 80% of 30

10% = 3

80% = 24

24

(2)

---

2. A bag of sugar contains 420g.
A special offer packet contains an extra 15%.

Work out how much extra sugar is in the special offer packet.

10% = 42g

5% = 21g

63 g

(2)

---

3. A new car is priced at £7500.
In a sale it is reduced by 20%.

Calculate the reduction in price.

10% = £750

20% = £1500

£ 1500

(2)

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

Section D

Statement	True or False
0.5 < 0.6	True
1.3 < 1.4	True
2.11 > 2.09	True
0.25 > 0.23	True
0.46 < 0.47	True
0.031 < 0.032	True
0.776 > 0.775	True

Statement	True or False
0.98 < 0.951	False
2.222 > 2.002	True
3.09 > 9.03	False
MAKE YOUR OWN	True
MAKE YOUR OWN	True
MAKE YOUR OWN	False
MAKE YOUR OWN	False

ANSWERS—WEEK 7

1. 46 **2.** 2.6 **3.** 14.8 **4.** 15.2 **5.** 0.2 **6.** 3.2

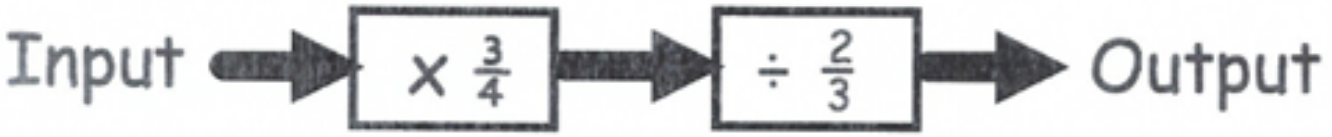
7. 7 **8.** 5.2 **9.** 3.14 **10.** 0.02 **11.** 1.02 **12.** 0.8

13. 0.24 **14.** 120 **15.** 1.8 **16.** 16 **17.** 88 **18.** 4.35

19. 2.75 **20.** 3.55 **21.** 0.16 **22.** 72.5 **23.** 18.3 **24.** 3.13

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)** $\frac{11}{4}$
10) $3\frac{5}{8} \div 7$	**10)** $\frac{29}{56}$
11) $4\frac{7}{10} \div 3\frac{3}{5}$	**11)** $\frac{47}{36}$
12) $4\frac{3}{10} \div 2\frac{3}{8} \div 1\frac{1}{4}$	**12)** $\frac{688}{475}$

ANSWERS—WEEK 8



(a) Find the output, if the input is 2.

$\frac{2}{1} \times \frac{3}{4} = \frac{6}{4}$

$= \frac{3}{2}$

$\frac{3}{2} \div \frac{2}{3}$

$\frac{3}{2} \times \frac{3}{2} = \frac{9}{4}$

$\frac{9}{4}$ or $2\frac{1}{4}$

(3)

(b) Find the input, if the output is $\frac{1}{2}$

$\frac{1}{2} \times \frac{2}{3} = \frac{2}{6} = \frac{1}{3}$

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

$\frac{1}{3} \times \frac{4}{3} = \frac{4}{9}$

$\frac{4}{9}$

(3)

20%	2.5%
£24	£29.25
£11.20	£13.65
£17.60	£21.45
£56	£68.25
£640	£780
£2720	£3315
£20960	£25545

25%	1%
£25	£20.20
£20	£16.16
£40	£32.32
£75	£60.60
£500	£404
£3375	£2727
£23125	£18685

Oliver's salary is £18,000 and he is due to get an increase of 4%.
How much will this increase be?

18000 × 0.04

or

1% = 180

4% = 720

£ 720

(2)

A new TV is priced at £320
In a sale it is reduced by 45%

or 320 × 0.55

Calculate the sale price

1% = 3.2

45% = 144

320 − 144 =

£ 176

(3)

Joanne sees this special offer in a shop.

Special Offer	
iPod	£189
Headphones	£25

Buy both items and receive a 4% discount

Joanne buys both items.

or 214 × 0.96

How much does she pay?

189 + 25 = 214

1% = 2.14

4% = 8.56

214 − 8.56

£ 205.44

(3)

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