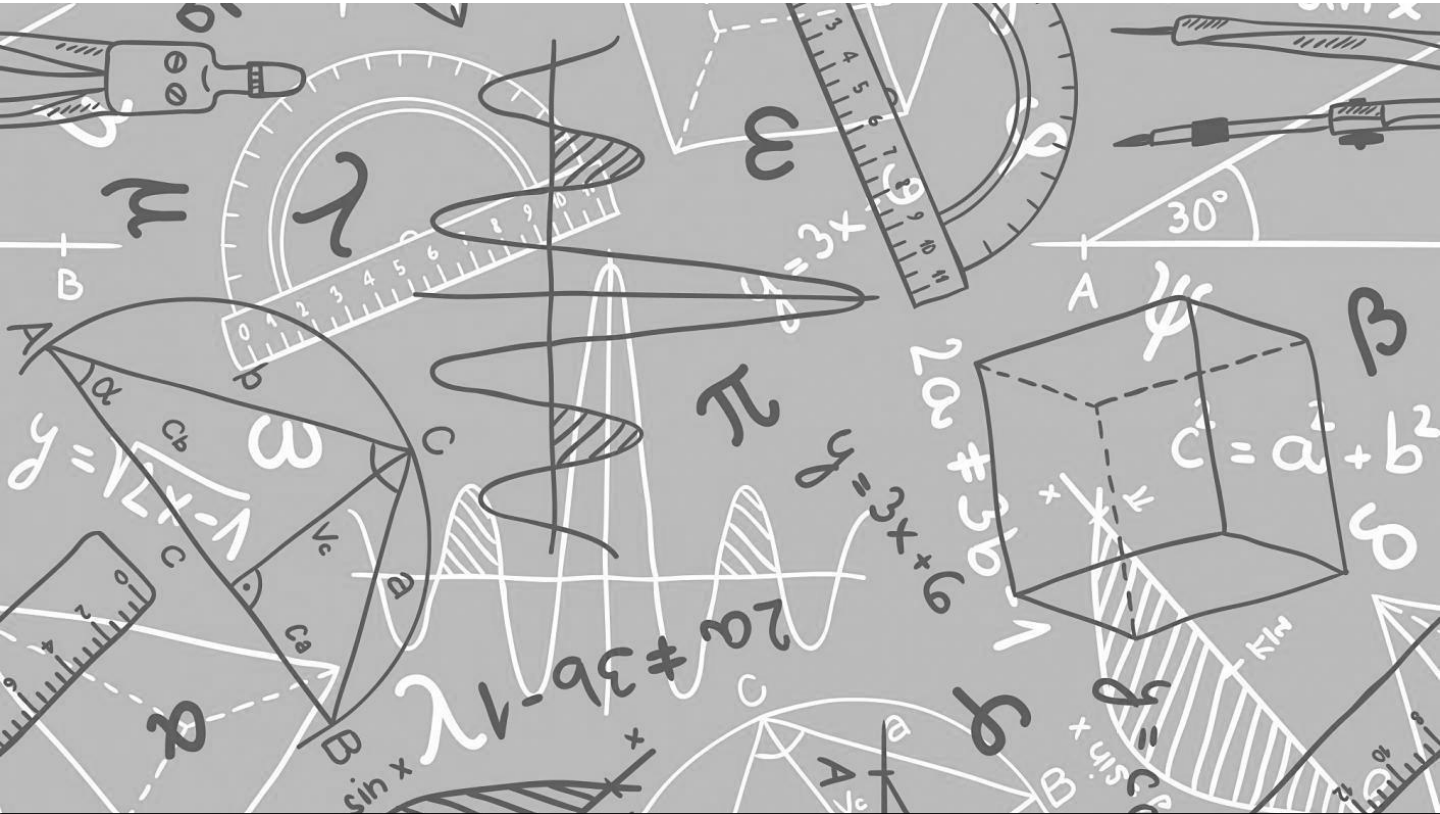




Maths



We can't wait to meet you...

All the maths teachers at Prince Henry's Grammar School are very much looking forward to meeting you. Normally at this time of year you find out about us, we find out about you and together we do some maths. Unfortunately, due to the usual transition activities being cancelled we won't meet in person, however hopefully by completing this booklet you will be able to find out some facts about the maths teachers at PHGS, do some research into some of our favourite mathematicians, and do some maths either on your own or with your family.

Meet the Department...

In the Maths Department we have thirteen maths teachers.

Throughout this booklet you will find out about some of our favourite maths related things. Come back to this page to fill them in when you spot them. Can you find them all?

Mr. Adam

Favourite Number:

Favourite Mathematician:

Mr Cooper

Favourite Number:

Favourite Mathematician:

Favourite Number:

Favourite Mathematician:

Mrs. Bamford

Mr. Field

Favourite Number:

Favourite Mathematician:

Favourite Number:

Favourite Mathematician:

Mr. Fishburn

Mr. Fox

Favourite Number:

Favourite Mathematician:

Favourite Number:
Favourite Mathematician:

Mrs. Greenhalgh

Favourite Number:
Favourite Mathematician:

Mrs. Moore

Miss. Normington

Favourite Number:
Favourite Mathematician:

Favourite Number:
Favourite Mathematician:

Mr. Russell

Miss. Wormald

Favourite Number:
Favourite Mathematician:

Favourite Number:
Favourite Mathematician:

Mr. West

Favourite Numbers:
Favourite Mathematician:

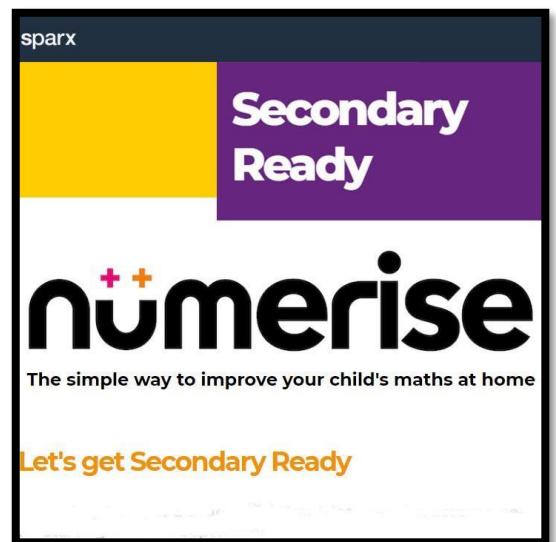
Mrs. Wray

Mr. Cooper's favourite number is φ , the golden ratio. This is a very special irrational number. Make sure you ask him about it.

Mr. Fishburn's favourite number is the smallest perfect number. Can you find out what a perfect number is?

Secondary Ready Course

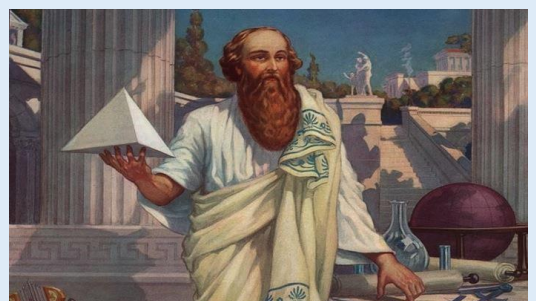
At Prince Henry's Grammar School all of our students use the excellent online learning tool Hegarty Maths. When you join us in September, we will set up your Hegarty Maths account and teach you how to use it.



We are delighted that the team behind Hegarty Maths have recently launched a free online programme called 'Secondary Ready' that you can access at home this summer.

Simply register at numerise.com/secondary-ready and complete the course. It's only twelve lessons and if you complete them all, you will be super ready for your Year 7 maths lessons. Let us know if you finish it – we can't wait to hear how you get on.

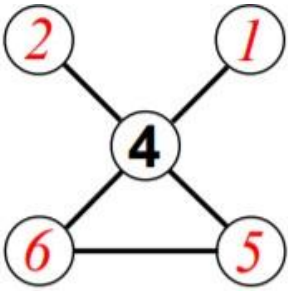
Mrs Bamford's favourite mathematician is Pythagoras of Samos. You'll learn all about his famous theorem in Year 8. Pythagoras was a controversial character in Ancient Greece. He believed that everything in the world could be explained by numbers.



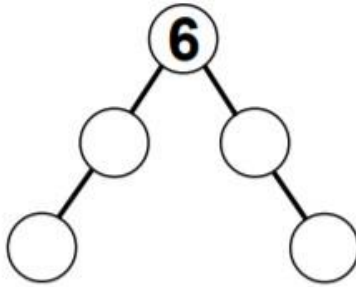
Totalines

Mr Adam's favourite number is the square root of nine

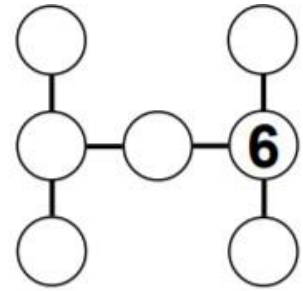
Numbers have to be placed in the empty circles. The numbers to be used are listed under each diagram and no given number may be used twice. The object is to place the numbers so that all those which lie along a straight line, as shown by the lines drawn, add up to the total which is also given under the diagram. The first one has been done for you.



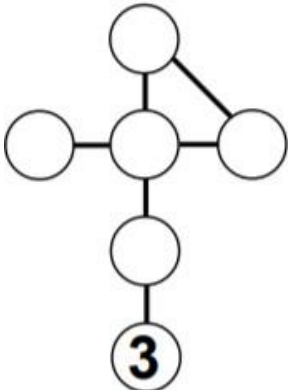
Use 1, 2, 5, 6
Total 11



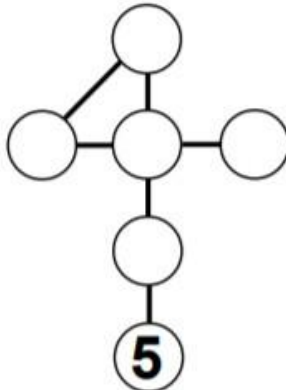
Use 2, 3, 4, 5
Total 13



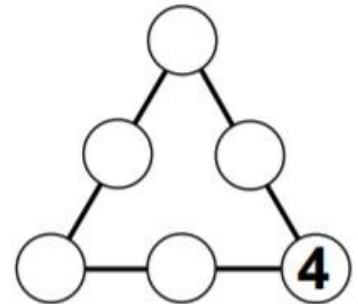
Use 0, 1, 2, 3, 4, 5
Total 10



Use 1, 2, 4, 5, 6
Total 11

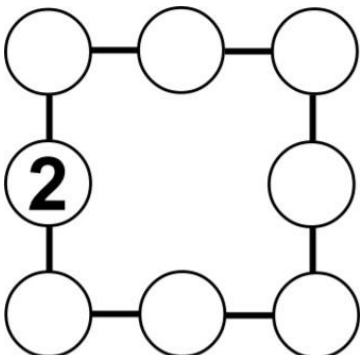


Use 0, 1, 3, 4, 6
Total 10

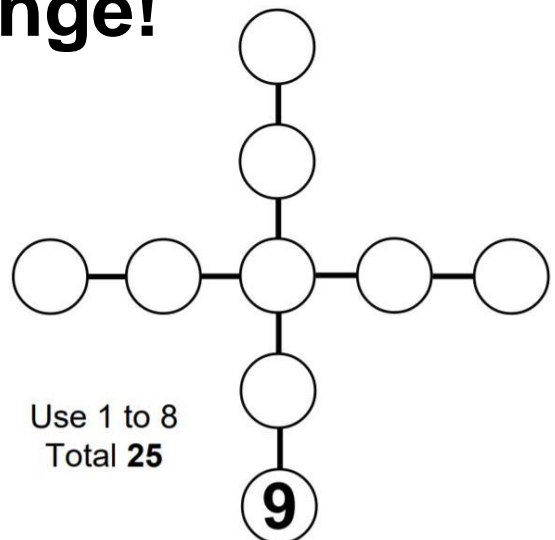


Use 0, 1, 2, 3, 5
Total 9

Challenge!



Use 3, 4, 5, 6, 7, 8, 9
Total 18



Use 1 to 8
Total 25

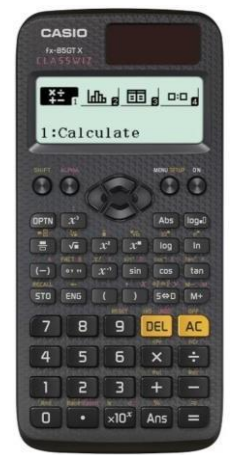
Mr Field's favourite number is e
This irrational number has extreme importance in mathematics. It is close in value to 2.72

Mrs Bamford's favourite number is the only even prime number

Maths Equipment

Secondary school mathematics is so exciting!

In Year 7 we'll start using a calculator in lessons. We'll all use the Casio FX83-GTX, but you'll have plenty of time to buy one through us so there's no need to buy one before you start. The most important thing is that you put your name on it when you get one, otherwise we'll get them all in a muddle.



You will also need a protractor, a pair of compasses, pencil, rubber and ruler that you should bring to every maths lessons. You will be able to buy all of these items from our Maths Shop.



Mr. Fishburn is a big fan of Ada Lovelace.
This English mathematician, the daughter of poet Lord Byron, has been called "the first computer programmer" for writing an algorithm for a computing machine in the mid-1800s.



ADDITION

1. $53 + 24$

2. $39 + 17$

3. $65 + 58$

4. $430 + 180$

5. Write the two missing digits to make this **addition** correct

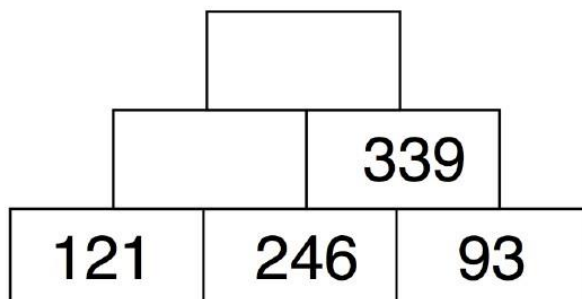
$$\begin{array}{r} \square 3 \\ + 1 \square \\ \hline 98 \end{array}$$

6.

Harry is 19 years old.
His grandad is 56 years older than Harry.

How old is Harry's grandad?

7. Find the missing numbers in this addition pyramid



SUBTRACTION

1. $78 - 51$

2. $72 - 16$

3. $90 - 23$

4. $580 - 149$

5. Write the two missing digits to make this subtraction correct

$$\begin{array}{r} 9 \square \\ - \square 2 \\ \hline 54 \end{array}$$

6. Write the missing number

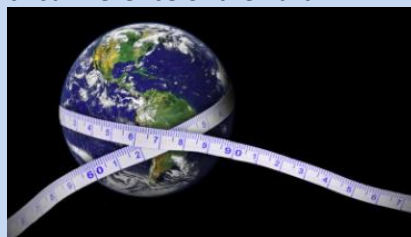
155 $\xrightarrow{\text{is 40 more than}}$ 115

212 $\xrightarrow{\text{is 40 more than}}$

7. Write the three missing digits to make this subtraction correct

$$\begin{array}{r} 5 \square 7 \\ - \square 8 \square \\ \hline 243 \end{array}$$

Mr. Fox's favourite mathematician is Eratosthenes who lived in Greece in the third century BC. Eratosthenes was the first person to calculate the circumference of the Earth



MULTIPLES

1. Write down the first **five** multiples of 3

--	--	--	--	--

2. Write down the first **five** multiples of 8

--	--	--	--	--

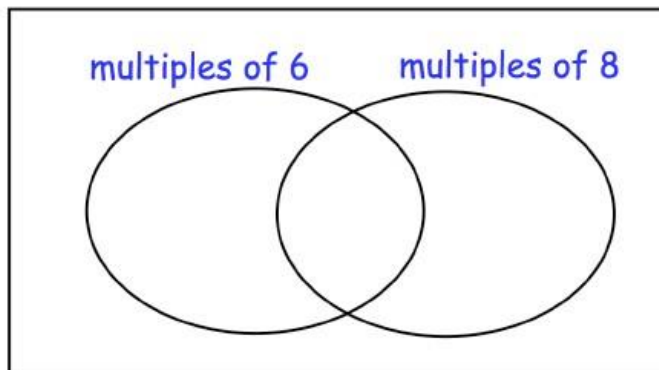
3. Write down the first **five** multiples of 13

--	--	--	--	--

4. Here is a diagram for sorting numbers.

Write **each** number in its correct place on the diagram.

40 48 56 60



Miss Wormald's favourite mathematician is Caroline Herschel. She was the first woman to receive the Royal Astronomical Society's gold medal in 1828, Herschel famously discovered seven new comets. After falling ill with typhus aged 10, the German mathematician never grew taller than four foot three and it was assumed she would never amount to much since she was unlikely to marry. However, when her astronomer brother William discovered the planet Uranus in 1781 she became his paid assistant, made numerous significant discoveries of her own and lived to the age of 97.

Mr. Russell's favourite number is 14^2

MULTIPLYING

1. 32×3

2. 15×5

3. 24×6

4. 74×6

A teacher wants to give each child in her class 4 sweets each.

6 In the class there are 30 children.

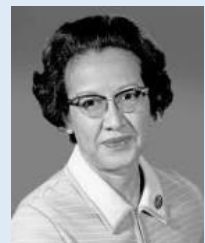


5

How many days are there in 12 weeks?

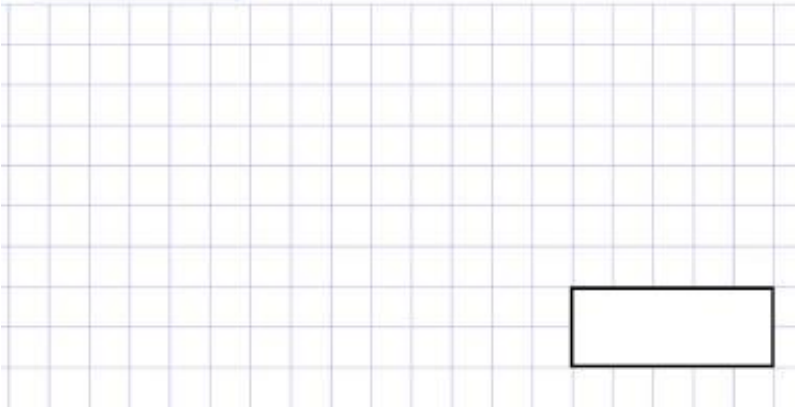
How many sweets does the teacher need?

Mr. West's favourite mathematician is Katherine Johnson who was an American mathematician. She worked at NASA in the 1960's on the project which eventually put the first man on the moon. She was able to perform complex calculations manually before computers could perform the calculations. You can find out about her time at NASA in the film 'Hidden Figures'



7

19×16

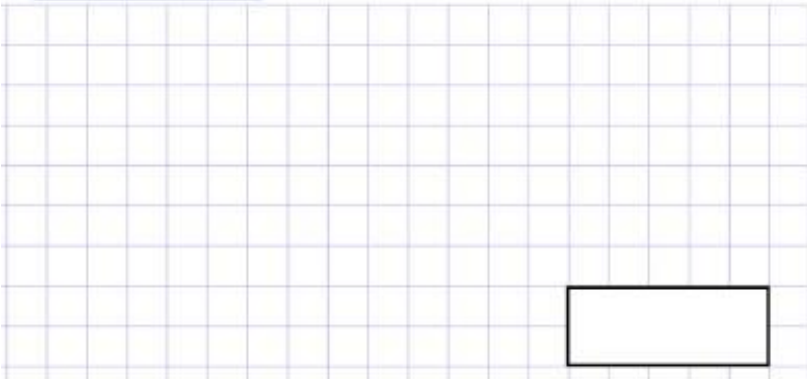


Mrs Moore's favourite number is π – pronounced pie



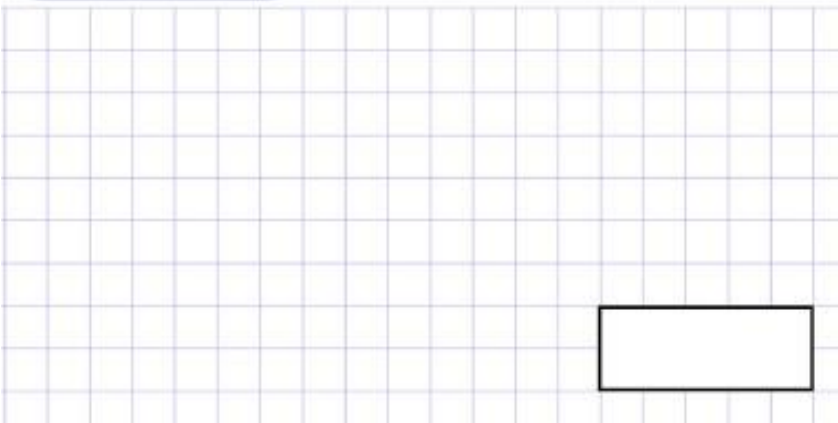
8

43×35

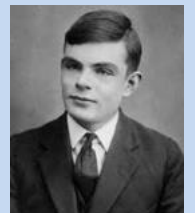


9

127×15

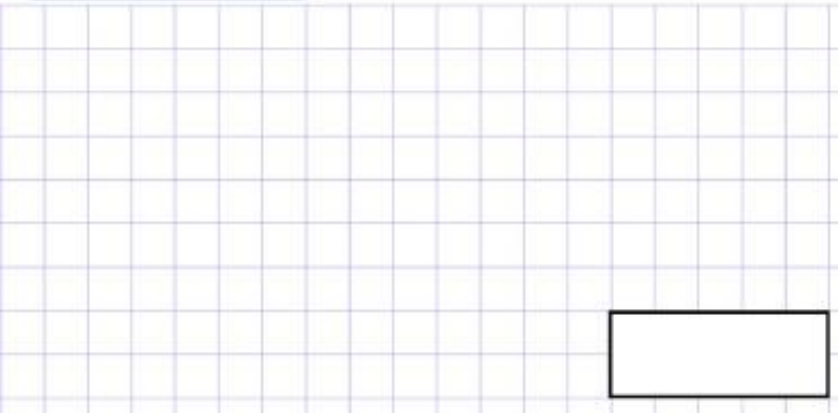


Mrs. Wray's favourite mathematician is Alan Turing. He is famous for his work during WWII when his team broke the German Enigma Code which led to the end of the war.



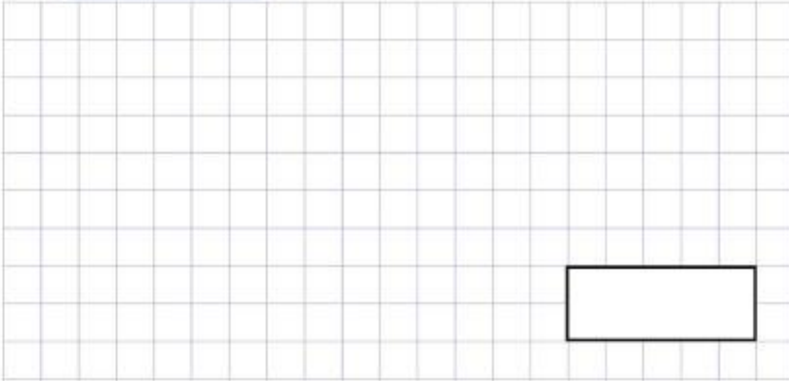
10

522×28

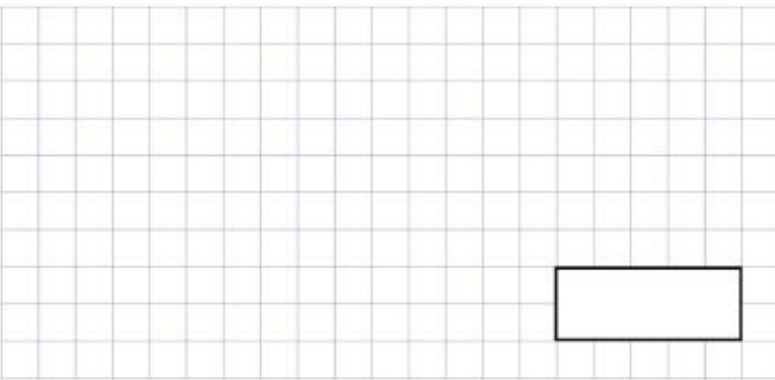


DIVIDING

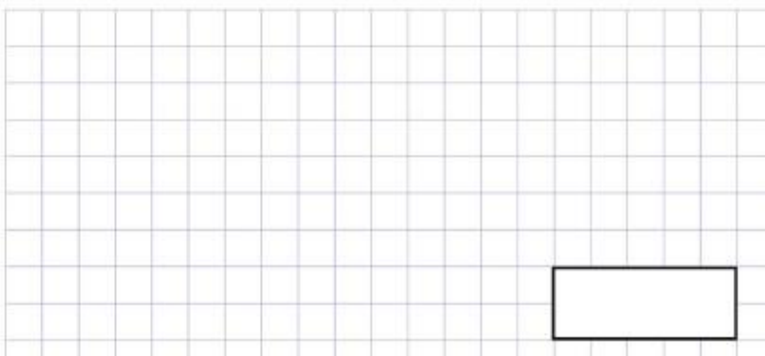
1. $46 \div 2$



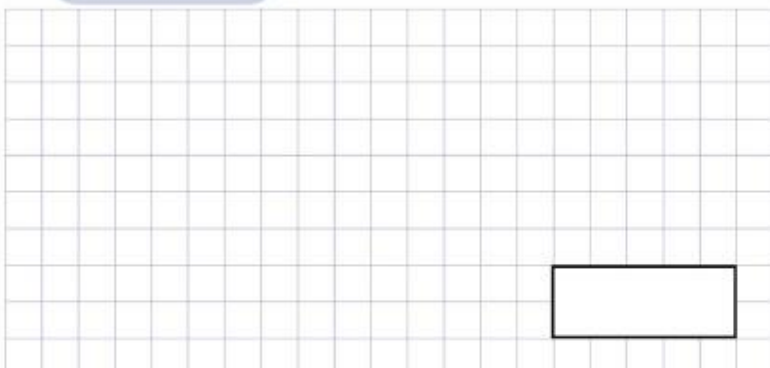
2. $55 \div 5$



3. $42 \div 3$



4. $84 \div 6$



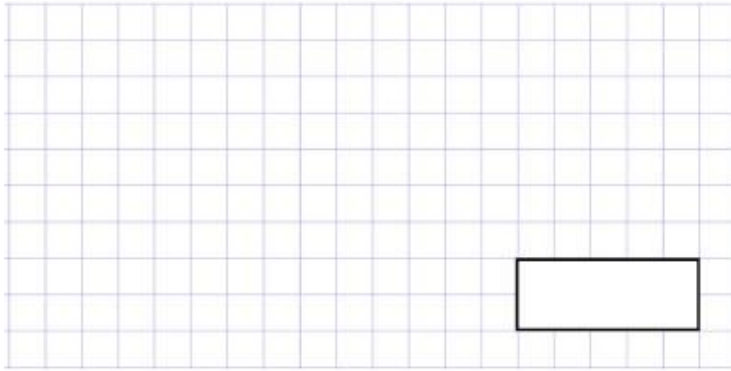
Miss Normington's favourite mathematician is Leonhard Euler. He is regarded as the most important mathematician of the 18th Century for his work on calculus which students in the sixth form study.



Miss Wormald's favourite number is the sum of the first two prime numbers.

5

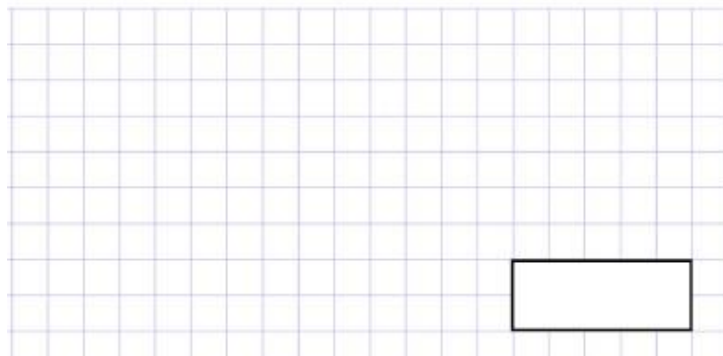
$$584 \div 8$$



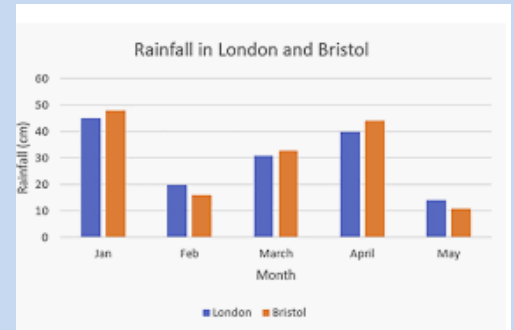
Mr Fox's favourite number is the product of 5 and 116

6

$$406 \div 7$$



Mrs Greenhalgh's favourite mathematician is William Playfair. He was a Scottish statistician who invented the line graph, bar chart and the pie chart. You are probably familiar with his work.



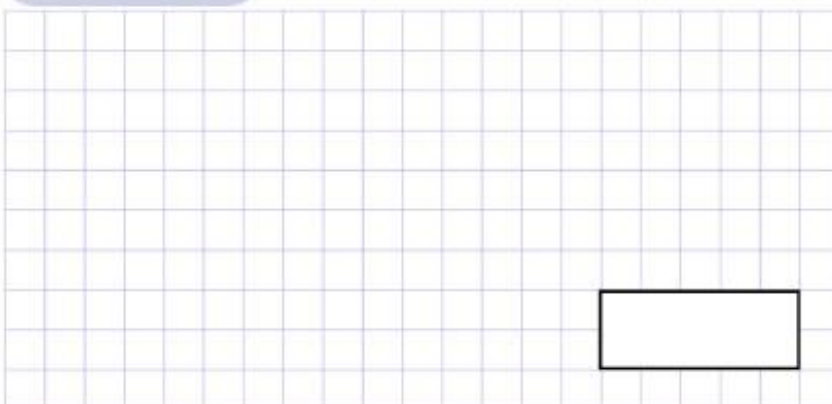
7

$$154 \div 11$$



8

$$374 \div 22$$



Mr West's favourite number is 186,282 which is the number of miles that light travels in 1 second.

DECIMALS

1. Write these numbers in order, starting with the **smallest**

9.2 2.9 5.4 8.7

--	--	--	--

smallest

largest

Mrs
Greenhalgh's
favourite
number is

$$\sqrt{64}$$

2. Write these numbers in order, starting with the **smallest**

0.59 1.24 0.45 1.34 0.88

--	--	--	--	--

smallest

largest

3. Write these numbers in order, starting with the **smallest**

0.304 0.41 0.088 2.1 0.9

--	--	--	--	--

smallest

largest

FRACTIONS

Equivalent fractions

1

Find the missing numbers

(a) $\frac{3}{4} = \frac{\square}{16}$

(b) $\frac{\square}{5} = \frac{6}{15}$

(c) $\frac{7}{8} = \frac{35}{\square}$

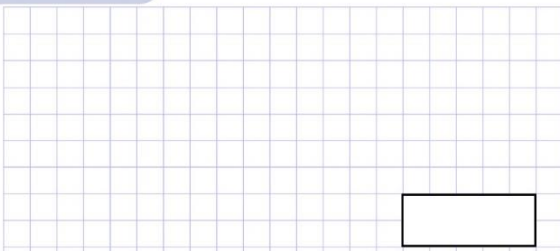
(d) $\frac{2}{\square} = \frac{16}{40}$

(e) $\frac{4}{15} = \frac{\square}{60}$

(f) $\frac{6}{11} = \frac{66}{\square}$

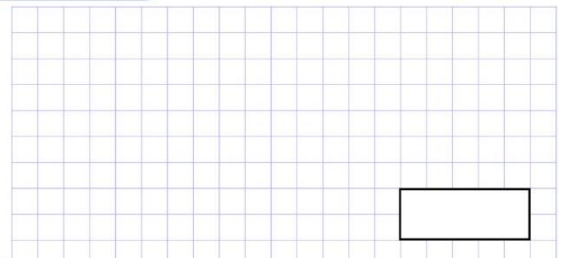
2

$$\frac{7}{9} - \frac{5}{9}$$



3

$$\frac{6}{11} + \frac{2}{11}$$



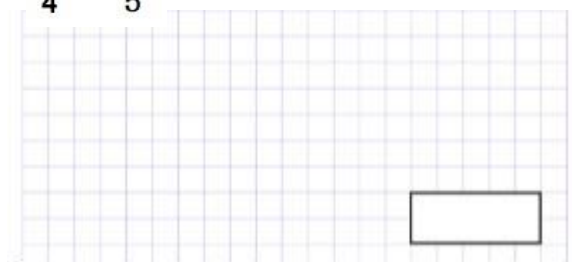
4

$$\frac{3}{4} + \frac{2}{9}$$



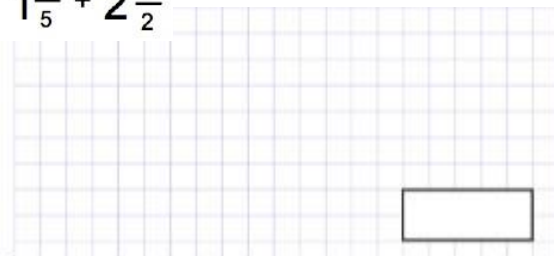
5

$$\frac{3}{4} - \frac{2}{5}$$



6

$$1\frac{2}{5} + 2\frac{1}{2}$$



7

$$4\frac{1}{3} - 3\frac{4}{9}$$



FRACTIONS

1

Write $\frac{7}{3}$ as a mixed number

2

Write $\frac{5}{2}$ as a mixed number

3

Write $\frac{16}{7}$ as a mixed number

4

Write $2\frac{3}{10}$ as an improper fraction

5

Write $4\frac{3}{4}$ as an improper fraction

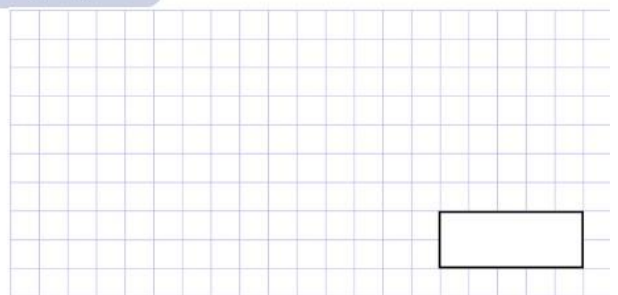
6

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

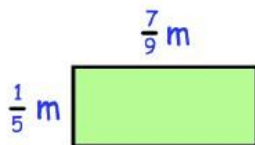


7

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



8



Find the area of this rectangle

9

Work out the missing number

$$\square \div \frac{7}{15} = \frac{2}{3}$$

m^2



Mr Adam's favourite mathematician is Euclid, the Greek mathematician who lived in Alexandria in Egypt around 300 BCE. Euclid is often referred to as the "Father of Geometry", and he wrote perhaps the most important and successful mathematical textbook of all time, the Elements.

Word Searches

Each of the blocks of letters below represents a maze. A way has to be found through the maze moving (up and down or across but **not** diagonally) from letter to letter. No letter may be used twice. In some cases arrows show where the maze is to be entered and left. The letters visited must spell words as you go, and these words can be written on the dashed lines to the right of each maze. The number of dashes show how many letters are in each word. The first one has been started.

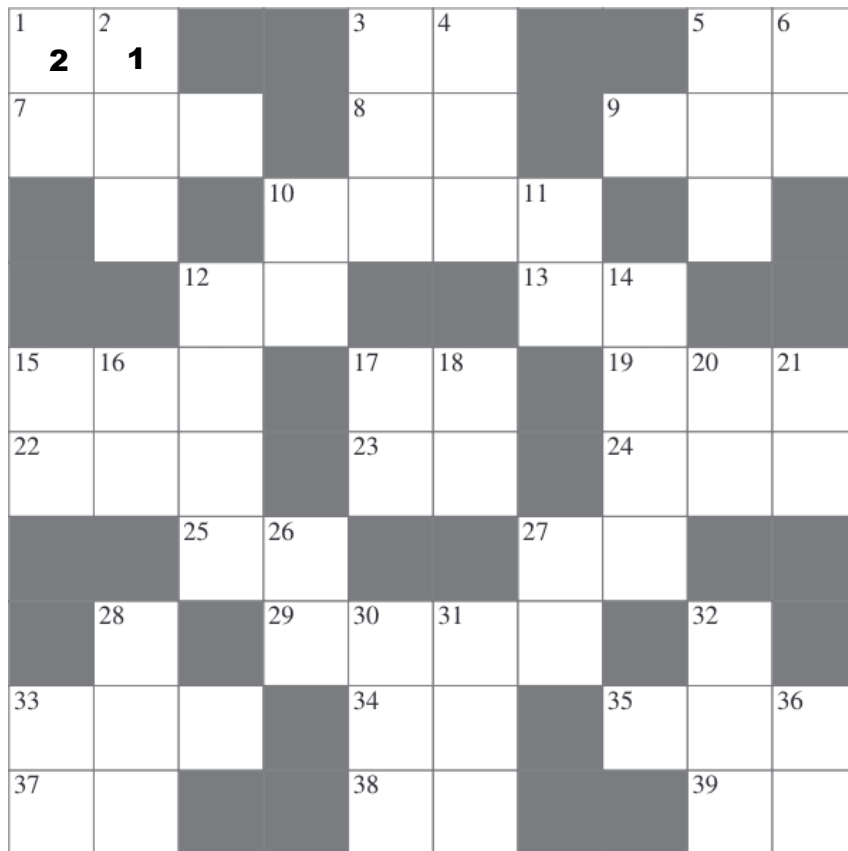
↓	↑	
M E R E E R U		M E T R E
R T G E E A S		D E G R E E
E D E D M M U		D E C I - - - -
M I C E R E S		- - - - -
A L N V A U Q		- - - - -
E H O E I C S		- - - - -
X A G R T A L		- - -
		- - - - -

↓	↑	
		C E R T I L - - - - -
		I R O R L E - - - -
		L C T C I N - - -
		E O D A F T - - - - -
		A A D B T C - - - - -
		R E S U R A - - - -
		- - - - -

↓	
G M E L E P	- - - - -
E O T G N O	- - - - -
N Y R R A L	- - - - -
U M B E G Y	- - - - -
O S U N O D →	- - - - -
B L L P M I	- - - - -
N O I M A R	- - - - -
G P R E P Y	- - - - -

O I T D I O	- - - - -
R R A O U B	- - -
E D T C C N	- - - - -
I N A G T O	- - - - -
L Y C O E S ←	- - - - -
B U S N R Q	- - - - -
M O H R A U	- - - - -

Cross Number



Mr Russell's favourite mathematician is Isaac Newton. He is famous for Newton's Laws of Motion and his theory of relativity.



Across

1. The number of spots on a standard dice (2)
3. The largest two-digit multiple of 13 (2)
5. One more than 8 ACROSS (2)
7. One quarter of the square of 6 DOWN (3)
8. $2 \times 2 \times 2 \times 2 \times 2$ (2)
9. A cube number (3)
10. $15 \text{ ACROSS} + 3 \text{ DOWN} + 6 \text{ DOWN} + 21 \text{ DOWN} + 36 \text{ DOWN}$ (4)
12. $39 \text{ ACROSS} - 33 \text{ DOWN}$ (2)
13. Twice (1 ACROSS + 1 DOWN) (2)
15. $1 \text{ DOWN} \times 38 \text{ ACROSS}$ (3)
17. $36 \text{ DOWN} - 8 \text{ ACROSS}$ (2)
19. A square number (3)
22. The smallest three-digit square number with all its digits different (3)
23. $1 \text{ ACROSS} + 6 \text{ DOWN}$ (2)
24. A multiple of 4 DOWN (3)
25. $27 \text{ ACROSS} + 37 \text{ ACROSS}$ (2)
27. $39 \text{ ACROSS} + 1 \text{ DOWN}$ (2)
29. $200 \times 12 \text{ ACROSS} + 27 \text{ DOWN}$ (4)
33. 10 times 2 dozen (3)
34. A square of a square number (2)
35. $5 \times 1 \text{ ACROSS} + \text{one-seventh of } 12 \text{ ACROSS}$ (3)
37. A half of 8 ACROSS (2)
38. A cube number (2)
39. One less than 6 DOWN (2)

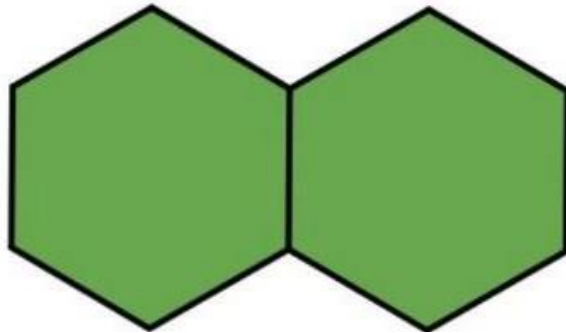
Down

1. A prime number (2)
2. The sum of the first ten prime numbers (3)
3. The number of hours in 39 days (3)
4. $2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$ (3)
5. $22 \text{ ACROSS} + 28 \text{ DOWN}$ (3)
6. The number of minutes in three-fifths of an hour (2)
10. A multiple of 7 (2)
11. $3 \times 37 \text{ ACROSS}$ (2)
12. $(22 \text{ ACROSS} - 6 \text{ DOWN}) \times 9$ (4)
14. A number all of whose digits are the same (4)
15. A prime number (2)
16. $27 \text{ ACROSS} - 8 \text{ ACROSS}$ (2)
17. A multiple of 9 (2)
18. A prime number (2)
20. A square number (2)
21. The square of a square number (2)
26. $3 \times 12 \text{ ACROSS}$ (2)
27. Two-thirds of 36 DOWN (2)
28. $22 \text{ ACROSS} - 1 \text{ DOWN}$ (3)
30. $1 \text{ ACROSS} \times 26 \text{ DOWN}$ (3)
31. $25 \text{ ACROSS} + 4 \text{ DOWN} + 5 \text{ DOWN}$ (3)
32. $17 \text{ DOWN} + 27 \text{ ACROSS}$ (3)
33. The sum of the digits of 1 DOWN, 17 ACROSS and 17 DOWN (2)
36. One and a half times 27 DOWN (2)

Mr. Cooper's favourite mathematician is Caleb Gattegno, an influential twentieth century maths educator. He is well known for his innovative approaches to teaching and learning mathematics and for inventing pedagogical materials for these approaches.



A Hexagon Problem



Heather can make two connected hexagons by drawing 11 lines.

What is the minimum number of lines Heather needs to draw 12 hexagons?

Extension: What numbers of hexagons are the most efficient to draw and why?

This problem is taken from puzzleoftheweek.com. If you enjoy doing puzzles then have a go at the weekly problems on this website.

Mr. Field's favourite mathematician is Grace Hopper, an American computer scientist and United States Navy rear admiral. She was one of the pioneers in the development of the electronic computer and is (probably) the only mathematician to have a warship named after her.





Mrs Moore's favourite mathematician is Srinivasa Ramanujan. He was born in India and although he did not attend university in India, he made substantial contributions to mathematical analyses, number theory and continued fractions even though famous mathematicians said that these mathematical problems were unsolvable.

CODE BREAKER

A	B	C	D	E	F	G	H	I	J	K	L	M
24	14	11	8	13	36	60	22	10	54	23	12	42
N	O	P	Q	R	S	T	U	V	W	X	Y	Z
6	16	40	7	30	9	19	29	63	32	15	25	18

STEP 1 Answer the questions below, find your answers in the table above, then write down the corresponding letter.

Work out $6 \times 3 + 6$ Letter: <input type="text"/>	Work out $6 \times (3 + 4)$ Letter: <input type="text"/>	Work out $(16 - 6) + 3$ Letter: <input type="text"/>	Work out $(7 + 5) - 2$ Letter: <input type="text"/>	Work out $9 + (5 - 2)$ Letter: <input type="text"/>
Work out $(12 + 4) \div 2$ Letter: <input type="text"/>	Work out $16 - (6 - 1)$ Letter: <input type="text"/>	Work out $22 - (2 + 9)$ Letter: <input type="text"/>	Work out $14 - 5 - 3$ Letter: <input type="text"/>	Work out $8 + 4 \div 2$ Letter: <input type="text"/>
Work out $(7 + 5) \times 3$ Letter: <input type="text"/>	Work out $3 + 2 \times 8$ Letter: <input type="text"/>	Work out $5 \times 2 + 2 \times 3$ Letter: <input type="text"/>	Work out $3 \times (3 + 2) \times 2$ Letter: <input type="text"/>	Work out $3 + 3 \times (2 + 5)$ Letter: <input type="text"/>

STEP 2 Rearrange the letters of your answers to make two words that are used in maths.

Miss Normington's favourite number is $\frac{12}{5}$ as a decimal

Mrs Wray has six favourite numbers they are all factors of 100 and multiples of 5