

# Maths Autumn 1

# Year 8

# Blended Learning Booklet

Name:

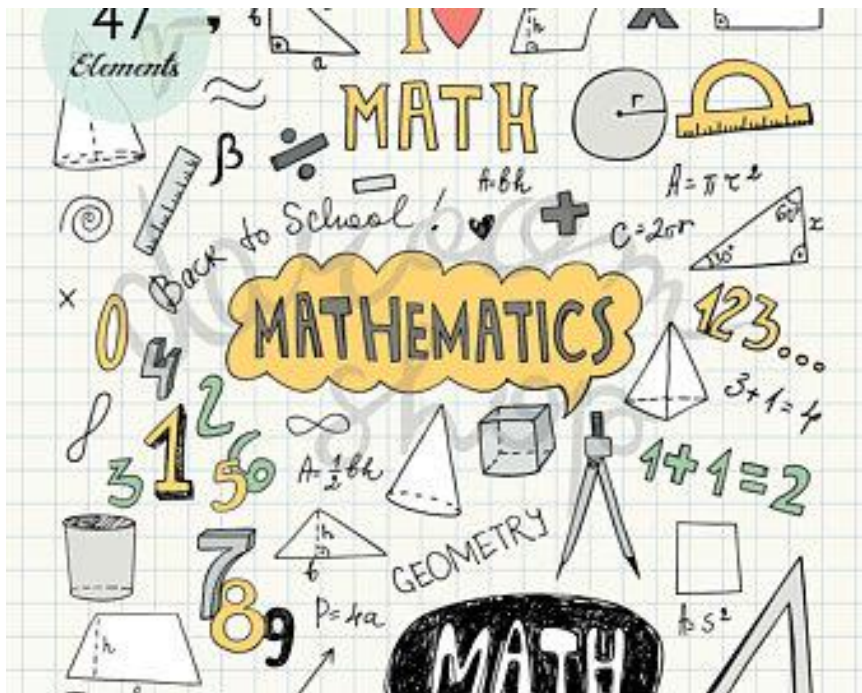
## Form:

Each week covers topics you would complete in your 3 Maths lessons that week. Write out the title and LI and then complete the tasks.

*All video links are online using the ClassCharts link.*

*The Knowledge Organiser on page 4 has further practice questions and page numbers linking to your pocket revision guides for all the key information and examples to help you with this unit.*

*Upload all work onto ClassCharts for feedback.*



## Contents

Page 3: Big Picture - Year 8 Overview

Page 4: Knowledge Organiser

Page 5-8: Week 1 – Factors, Multiples, HCF and LCM

Page 9-14: Week 2 – Prime Numbers

Page 15-17: Week 3 – Indices and Roots

Page 18-21: Week 4 - Fractions

Page 22-24: Week 5 – Fractions

Page 25-29: Week 6 – Problem Solving

Page 30: Assessment Ladder

Big Picture

Knowledge Organiser

## Week 1: Factors, Multiples, HCF and LCM

- **LI: Understand and calculate factors, multiples, highest common factors and lowest common multiples of numbers**

### Demonstration Videos:

<https://corbettmaths.com/2012/08/24/factors/>

<https://corbettmaths.com/2012/08/11/1335/>

<https://corbettmaths.com/2012/08/11/lcm-and-common-multiples/>

<https://corbettmaths.com/2012/08/24/common-factors-and-hcf/>

### Tasks:

#### Concept corner

Numbers in the 4 times table are called \_\_\_\_\_ of 4.

The first four **multiples** of 5 are 5, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_.

A \_\_\_\_\_ of a whole number is any whole number that divides into it exactly.

The **factors** of 20 are 1, 2, 4, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_.

Use some of these to fill in the gaps:

factor	multiples		
two	5	15	20
11	13	10	8

1. Write down the next 5 multiples of:

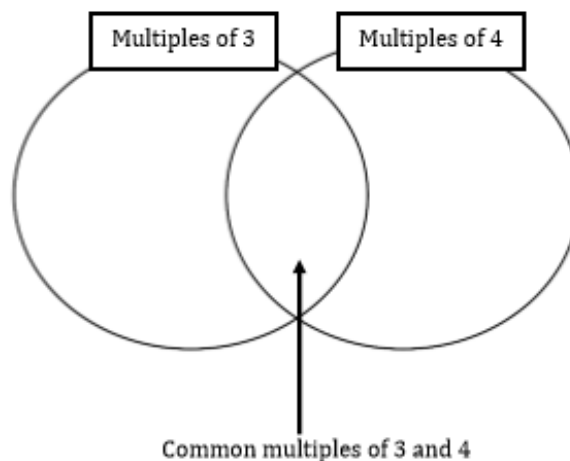
a) 3 .....

b) 6 .....

c) 18 .....

d) 4.5 .....

2. Complete the Venn diagram below, using the first 10 multiples for each number.



3. Write down:

a) a multiple of 6 between 30 and 40 .....

b) a multiple of 7 between 50 and 60 .....


4. Write down the first three numbers that are multiples of both of the numbers:

a) 4 and 5 .....

b) 4 and 6 .....

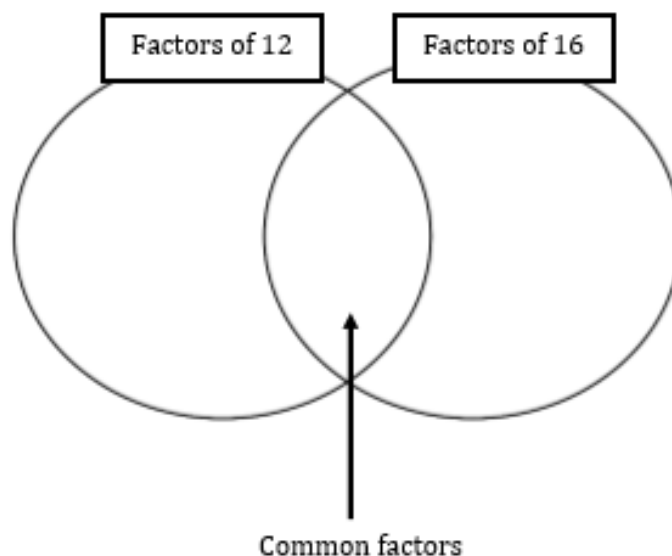
c) 4 and 7 .....

5. Circle the factors of 12 and the factors of 16.

a) Factors of 12 

Factors of 16 

b) Use your answers to complete the Venn diagram below.



c) What is the highest common factor of 12 and 16? .....

6. Find all the factors of each of these numbers:

- a) 18 .....number of factors .....
- b) 25 .....number of factors .....
- c) 40 .....number of factors .....
- d) 11 .....number of factors .....
- e) 36 .....number of factors .....
- f) 37 .....number of factors .....
- g) 24 .....number of factors .....
- h) 1 .....number of factors .....

- (a) Write down the first ten multiples of 5.
- (b) Write down the first ten multiples of 8.
- (c) Find the lowest common multiple (LCM) of 5 and 8.

- (a) Write down the first ten multiples of 6.
- (b) Write down the first ten multiples of 8.
- (c) Find the lowest common multiple (LCM) of 6 and 8.

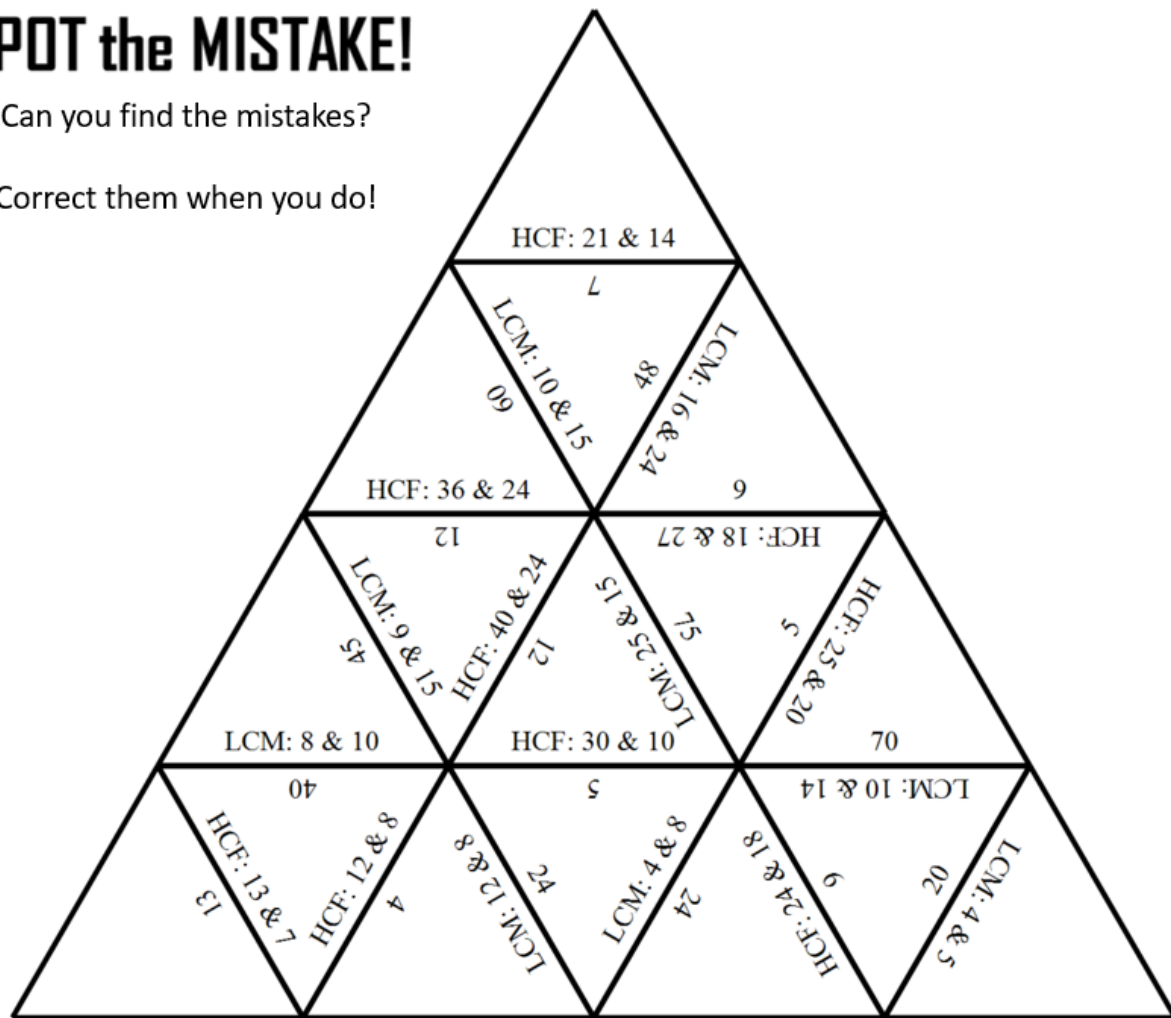
- (a) List all the factors of 14
- (b) List all the factors of 21
- (c) Find the highest common factor (HCF) of 14 and 21.

- (a) List all the factors of 24
- (b) List all the factors of 36
- (c) Find the highest common factor (HCF) of 24 and 36.

## SPOT the MISTAKE!

Can you find the mistakes?

Correct them when you do!



Find the HCF/LCM on the right and cross off the answers in the grid. Put the answers that are left over into the boxes at the bottom and find the total.

Name \_\_\_\_\_

HCF and LCM

72	8	24	2	12
5	4	96	1	14
7	135	12	3	3
7	90	6	105	63
9	21	80	16	32

Highest common factor of 16 and 80	Highest common factor of 21 and 42	Highest common factor of 16 and 44	Lowest common multiple of 16 and 32
Highest common factor of 24 and 56	Lowest common multiple of 9 and 21	Highest common factor of 15 and 35	Highest common factor of 18 and 45
Lowest common multiple of 8 and 18	Lowest common multiple of 7 and 15	Lowest common multiple of 24 and 32	Highest common factor of 11 and 20
Highest common factor of 24 and 36	Highest common factor of 15 and 18	Lowest common multiple of 10 and 16	Highest common factor of 8 and 18
Highest common factor of 28 and 63	Lowest common multiple of 15 and 18	Lowest common multiple of 27 and 45	Highest common factor of 24 and 42

TOTAL



## Week 2: Prime Numbers

- **L1: Understand primes numbers, represent numbers using prime factorisation and use prime factors to calculate HCF and LCM**


Demonstration Videos:

<https://corbettmaths.com/2013/03/24/prime-numbers/>

<https://corbettmaths.com/2012/08/20/product-of-primes/>

<https://corbettmaths.com/2012/08/20/lcm-and-hcf-using-product-of-primes/>

Tasks:

 **START!**      Which numbers are prime?

5	12	1	9	2	22
25	31	51	27	19	3
17	41	53	47	23	63
107	29	101	67	21	105
83	111	54	151	123	113
79	61	81	127	61	11
39	131	49	57	129	87

**FINISH!**

Question 3: From the box, choose:

- the smallest prime number
- a prime number that is greater than 10
- an even prime number
- the largest prime number
- three numbers that are not prime

7                      19                      2

                         17                      81

9                      1                      27                      99

101                      100                      55

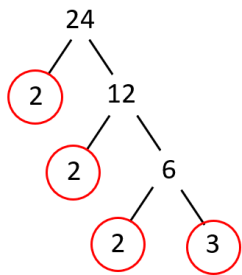
Apply

Question 1: Explain why Evie is wrong.

All prime numbers are odd



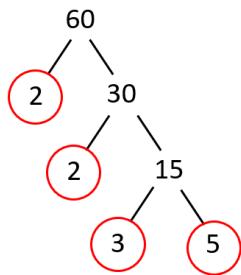
Express this number as a product of its prime factors, in index form.



$$24 = 2 \times 2 \times 2 \times 3$$

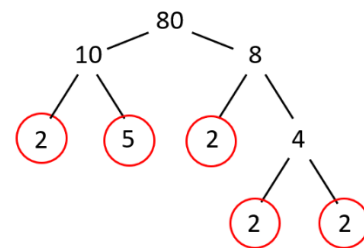
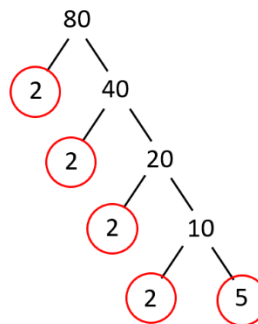
$$24 = 2^3 \times 3$$

Express this number as a product of its prime factors, in index form.



$$60 = 2 \times 2 \times 3 \times 5$$

$$60 = 2^2 \times 3 \times 5$$



$$80 = 2^4 \times 5$$

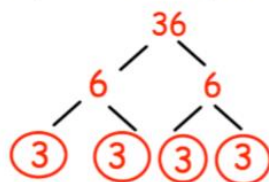
Same answer, different method.  
What are the advantages and disadvantages of each?

**Question 2:** Write each of these numbers as the product of their prime factors. Give your answers in index form.

- |        |         |        |        |         |         |         |
|--------|---------|--------|--------|---------|---------|---------|
| (a) 36 | (b) 40  | (c) 28 | (d) 48 | (e) 80  | (f) 200 | (g) 75  |
| (h) 32 | (i) 105 | (j) 81 | (k) 52 | (l) 242 | (m) 108 | (n) 500 |

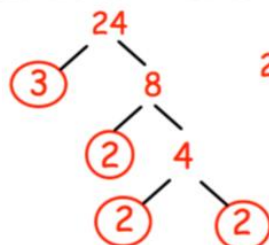
**Question 3:** Ashley has completed his homework. Can you spot any mistakes?

Express 36 as a product of its prime factors.



$$36 = 3 \times 3 \times 3 \times 3$$

Write 24 as the product of its prime factors. Give your answer in index form.

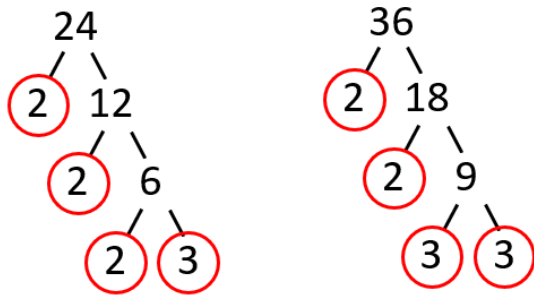


$$24 = 2 \times 2 \times 2 \times 3$$

## Challenge:

Find the **Highest Common Factor (HCF)** &  
**Lowest Common Multiple (LCM)** of 24 & 36.

1) Complete Prime Factorisation for both numbers.



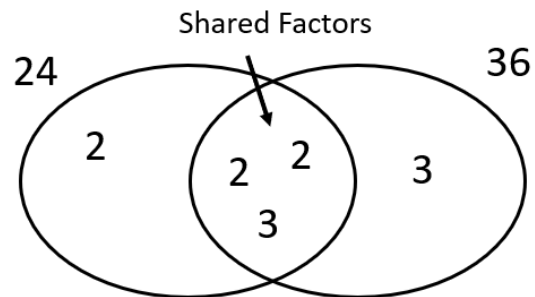
Question

(a) 900

$$24 = \cancel{2} \times \cancel{2} \times \cancel{2} \times \cancel{3}$$

$$36 = \cancel{2} \times \cancel{2} \times \cancel{3} \times \cancel{3}$$

2) Input the Prime Factors into a Venn diagram



3) **HCF** = Product of **shared** factors

$$2 \times 2 \times 3 = 12$$

4) **LCM** = Product of **all** factors in the diagram

$$2 \times 2 \times 2 \times 3 \times 3 = 72$$

## Differentiated Tasks:

Find the **Highest Common Factor (HCF)** &  
**Lowest Common Multiple (LCM)** of these pairs of numbers.

a) 20 & 30    HCF =  
                  LCM =

b) 12 & 40    HCF =  
                  LCM =

c) 18 & 45    HCF =  
                  LCM =

a) 54 & 36

b) 80 & 24

c) 90 & 150

a) 80 & 300

b) 12 & 18 & 90

c) 80 & 150 & 180

Choose one of the following three pages to work on based on your confidence in prime factorisation





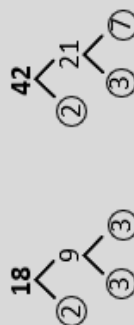
## 1 Finding HCF & LCM Using Prime Factorisation



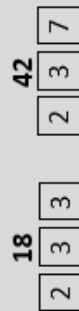
### EXAMPLE 1) Find the Highest Common Factor (HCF) & Lowest Common Multiple (LCM) of 18 and 42.

a) Start by finding the Prime Factors of each number.

$$18 : 2 \times 3 \times 3 \quad 42 : 2 \times 3 \times 7$$



b) Complete a Venn diagram with the factors.



Factors both numbers share.

c) The **HCF** is the **product** of the shared factors.

$$\text{HCF} = 2 \times 3 = 6$$

d) The **LCM** is the **product** of all the factors in the Venn diagram.

$$\text{LCM} = 3 \times 2 \times 3 \times 7 = 126$$

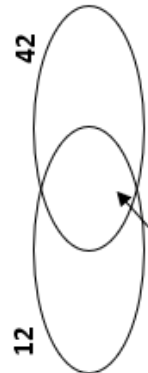
2) Find the **Highest Common Factor (HCF)** & **Lowest Common Multiple (LCM)** of 12 and 42.

a) Find the Prime Factors.

$$12 : \quad 42 :$$



b) Complete the Venn Diagram.



Factors both numbers share.

c) **HCF** = multiply shared factors

$$\text{HCF} =$$

d) **LCM** = multiply all the diagram factors

$$\text{LCM} =$$

3) Find the **HCF** & **LCM** of 60 & 75.

a) Find the Prime Factors.

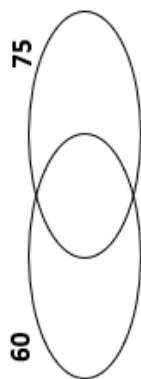
$$60 : \quad 75 :$$



b) Complete the Venn Diagram.

$$\text{c) HCF} =$$

$$\text{d) LCM} =$$



4) Find the **HCF** & **LCM** of 90 & 120.

a) Find the Prime Factors.

$$90 : \quad 120 :$$

b) Complete the Venn Diagram.

$$\text{c) HCF} =$$

$$\text{d) LCM} =$$



5) Find the **HCF** & **LCM** of 84 & 140.

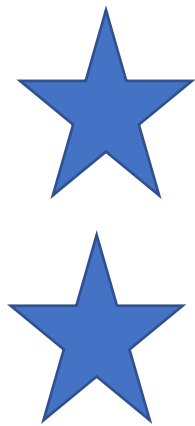
a) Find the Prime Factors.

$$84 : \quad 140 :$$

b) Complete a Venn Diagram.

$$\text{c) HCF} =$$

$$\text{d) LCM} =$$



2

## Finding HCF & LCM Using Prime Factorisation

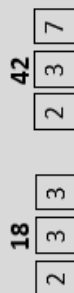


**EXAMPLE** 1) Find the **Highest Common Factor (HCF)** & **Lowest Common Multiple (LCM)** of 18 and 42.

a) Start by finding the Prime Factors of each number.

$$18 : 2 \times 3 \times 3 \quad 42 : 2 \times 3 \times 7$$

b) Complete a Venn diagram with the factors.



Factors both numbers share.

c) The **HCF** is the **product** of the shared factors.

$$\text{HCF} = 2 \times 3 = 6$$

d) The **LCM** is the **product** of all the factors in the Venn diagram.

$$\text{LCM} = 3 \times 2 \times 3 \times 7 = 126$$

2) Find the **HCF & LCM** of 100 & 60.

a) Find the Prime Factors.

$$100$$

$$60$$

b) Complete the Venn Diagram.

c) **HCF** =

d) **LCM** =



3) Find the **HCF & LCM** of 72 & 108.

a) Find the Prime Factors.

b) Complete the Venn Diagram.

c) **HCF** =

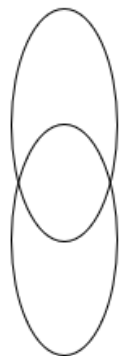
d) **LCM** =



4) Find the **HCF & LCM** of 180 & 135.

**HCF**

**LCM** =



5) Find the **HCF & LCM** of 210 & 175.

**HCF** =

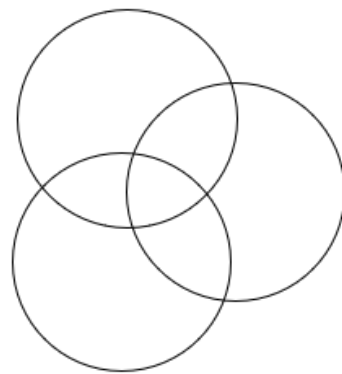
**LCM** =

6) Find the **HCF & LCM** of 288 & 216.

**HCF** =

**LCM** =

7) Find the **HCF & LCM** of 108, 162 & 135.



**HCF** =

**LCM** =



## 3) Finding HCF & LCM Using Prime Factorisation

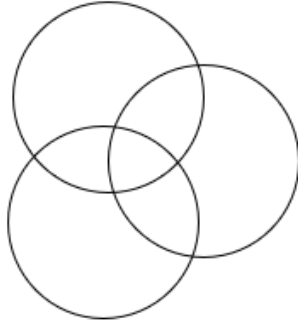


5) The LCM of these two numbers is 2700. What are the two numbers?



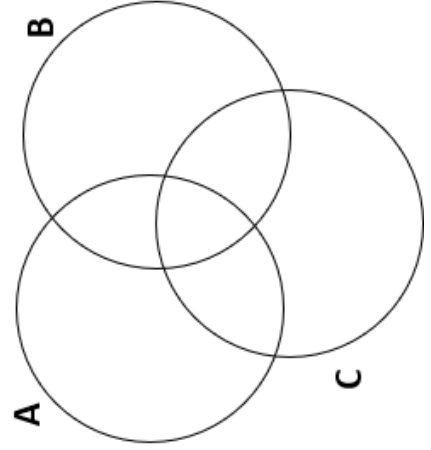
6) For two numbers both less than 100, the HCF is 18 and the LCM is 270. What are the two numbers?

7) Find the **HCF** & **LCM** of 135, 270 & 225.



**HCF** = **LCM** =

- 8) The HCF of A, B, & C is 6.  
The HCF of A & B is 36.  
The HCF of B & C is 42.  
The HCF of A & C is 30.  
B = 252  
The LCM of A, B & C is 18900.



Complete the Venn Diagram.

What numbers are A & C?

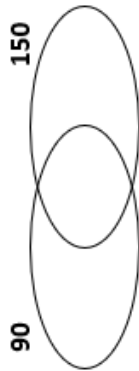
A =

C =

1) Find the **HCF** & **LCM** of 90 & 150.

a) Find the Prime Factors.

b) Complete the Venn Diagram.



c) **HCF** = the **product** of the shared factors.

**HCF** =

d) **LCM** = the **product** of all the factors in the Venn diagram.

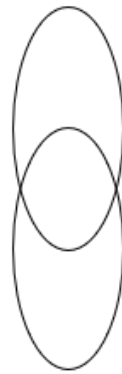
**LCM** =

2) Find the HCF & LCM of 350 & 280.



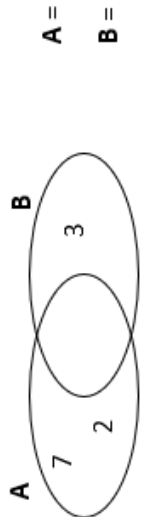
**HCF** = **LCM** =

3) Find the HCF & LCM of 288 & 120.



**HCF** = **LCM** =

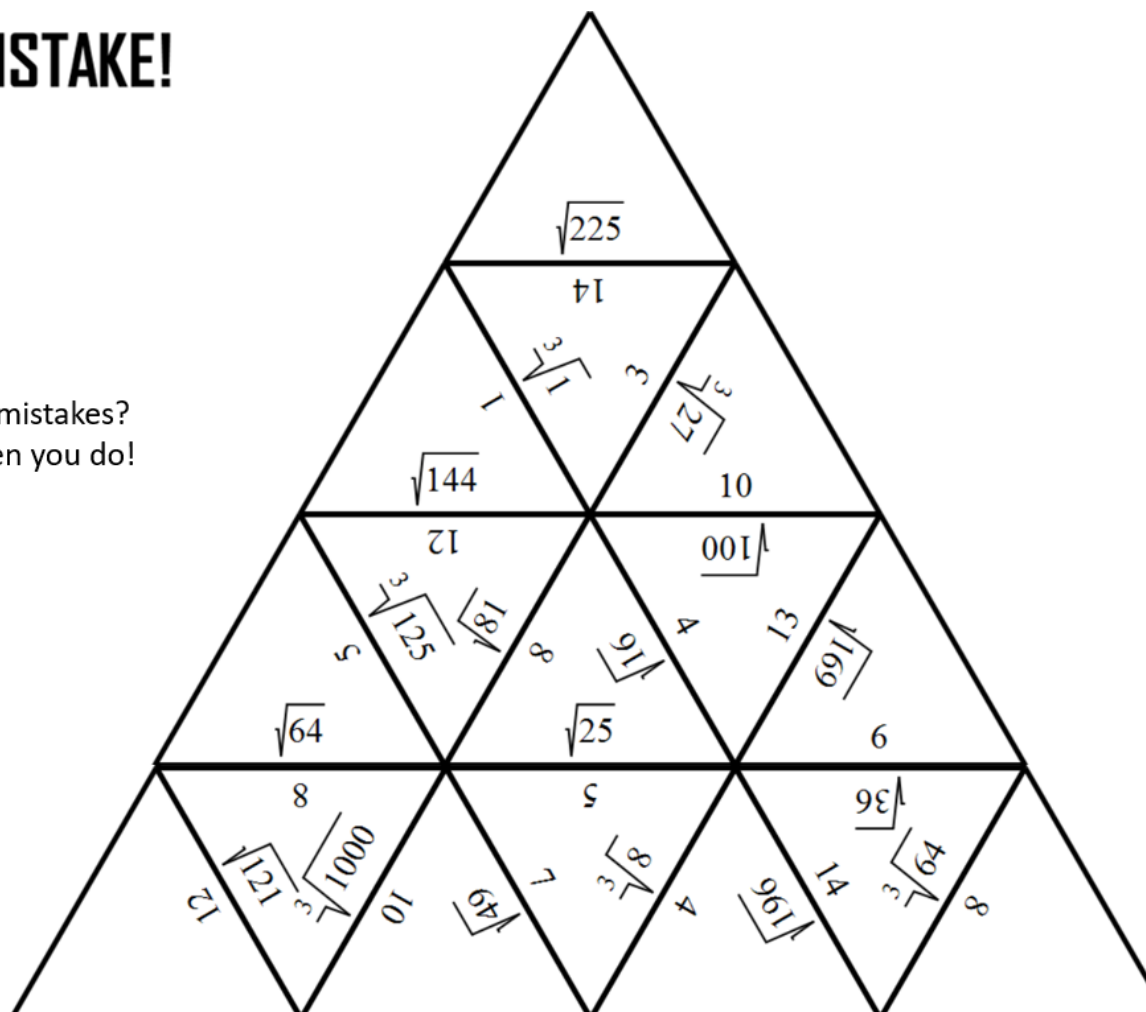
4) The HCF of A and B is 28. What are A and B?





## SPOT the MISTAKE!

Can you find the mistakes?  
Correct them when you do!



Name \_\_\_\_\_

144	16	15	6	49
2	121	36	1	6
169	16	8	3	10
3	81	1	2	4
225	13	9	5	7

square root of 225

square root of 4

square of 11

*Squares and roots*

9 squared

square of 15

square of 4

square root of 169

1 squared

square root of 1

square root of 49

square root of 100

3 squared

square root of 36

square root of 64

square root of 25

12 squared

square of 6

square of 13

7 squared

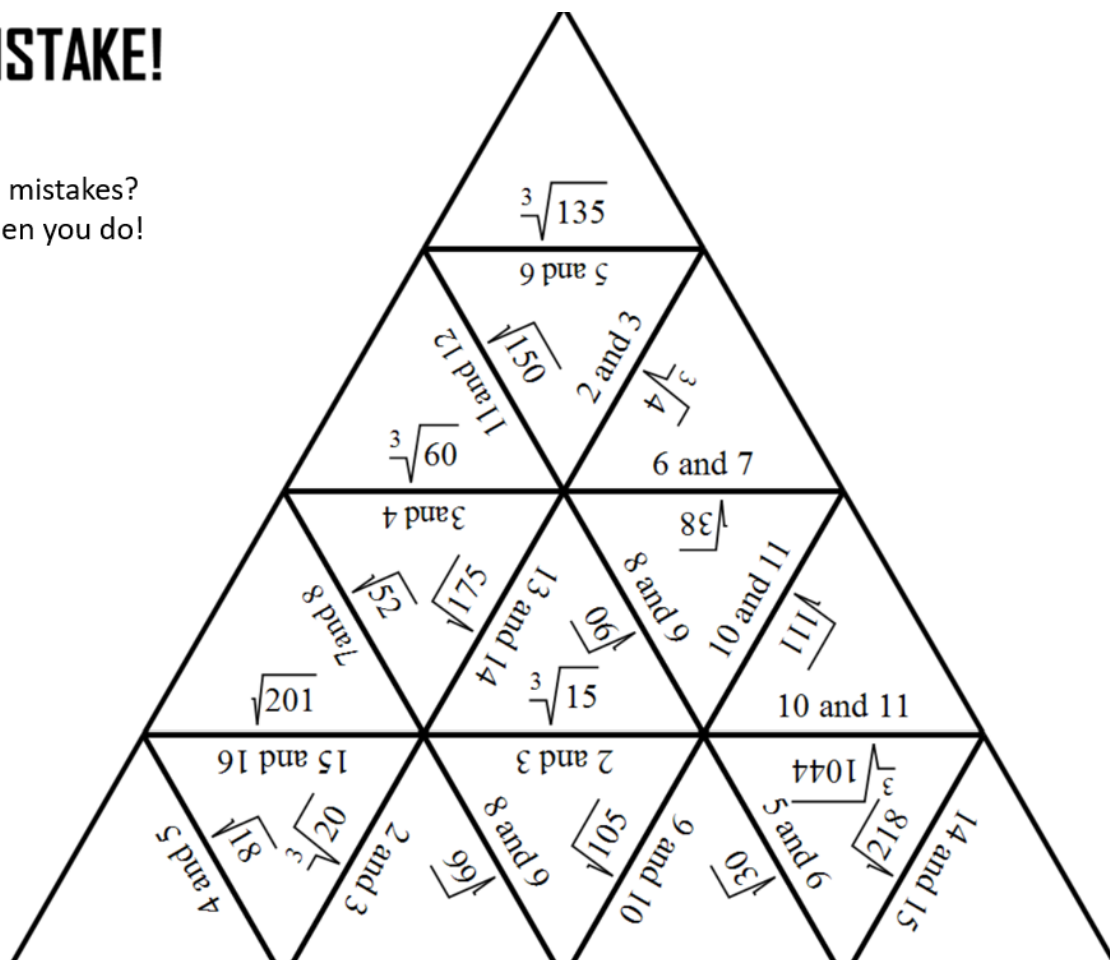
square of 2

TOTAL



## SPOT the MISTAKE!

Can you find the mistakes?  
Correct them when you do!



Name

125	8	9	1	6
11	6	13	3	9
16	5	8	2	25
64	27	7	64	15
1	144	36	12	100

Squares, cubes and roots

4 cubed	square root of 49	3 squared	cube root of 1
cubre root of 125	square root of 4	4 squared	square root of 36
8 squared	3 cubed	1 cubed	square root of 121
2 cubed	square root of 225	square root of 169	6 squared
5 cubed	square root of 9	10 squared	12 squared

TOTAL

## Week 4: Fractions

- LI: Understand, use and convert equivalent fractions, improper fractions and mixed numbers

### Demonstration Videos:

<https://corbettmaths.com/2013/03/03/simplifying-fractions-2/>

<https://corbettmaths.com/2013/02/15/equivalent-fractions/>

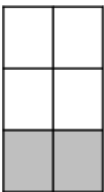
<https://corbettmaths.com/2013/02/15/improper-fractions-to-mixed-numbers/>

<https://corbettmaths.com/2013/02/15/mixed-numbers-to-improper-fractions/>

### Tasks:

### Simplifying Fractions


2 out of 6 pieces are shaded.



$\frac{2}{6}$

↑

The same size is shaded. Now it is 1 out of 3.

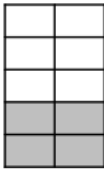


$\frac{1}{3}$

We have **simplified** the fraction!


Use the diagrams to simplify each fraction. Write the new fraction below!

**A**



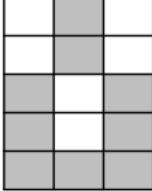
$\frac{4}{10}$

↑



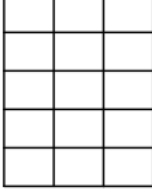
$\frac{5}{5}$

**B**

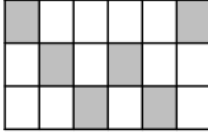


$\frac{8}{12}$

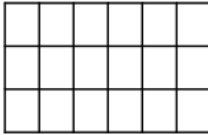
↑



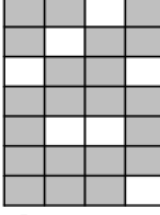
**C**



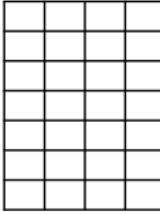
↑



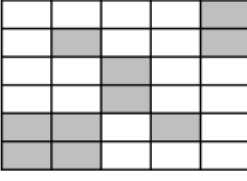
**D**



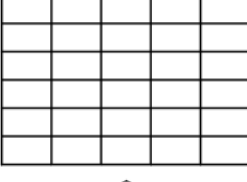
↑



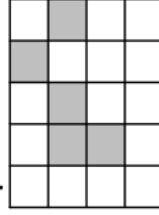
**E**



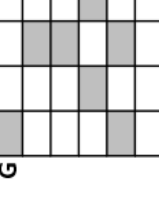
↑



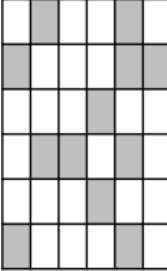
**F**



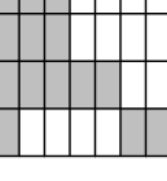
↑



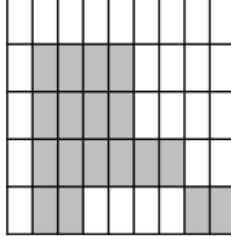
**G**



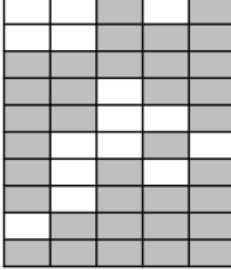
↑



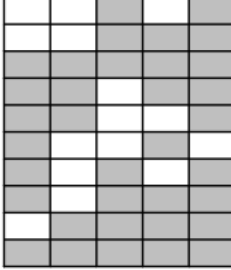
**H**



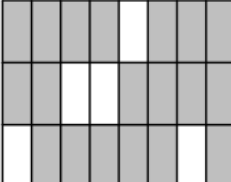
↑



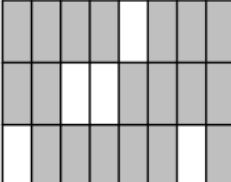
**I**



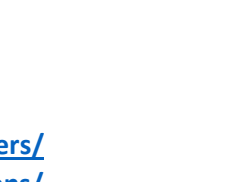
↑



**J**

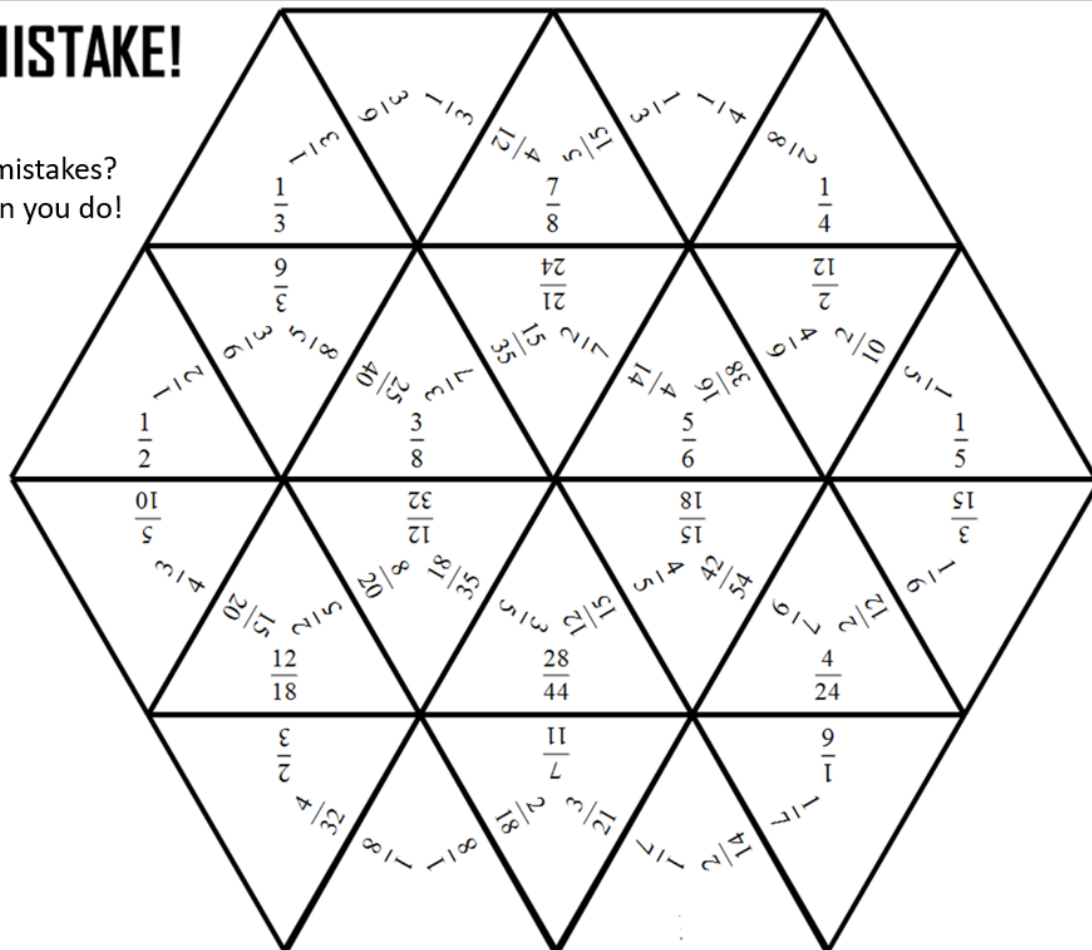


↑



## SPOT the MISTAKE!

Can you find the mistakes?  
Correct them when you do!



- 1 Find the smaller fraction and cross it off in the answer grid. Circle the remaining 5.

$\frac{1}{3}$ or $\frac{5}{9}$	$\frac{4}{12}$ or $\frac{1}{4}$	$\frac{1}{5}$ or $\frac{4}{15}$	$\frac{3}{28}$ or $\frac{1}{7}$	$\frac{1}{6}$ or $\frac{7}{30}$
$\frac{2}{3}$ or $\frac{7}{9}$	$\frac{5}{10}$ or $\frac{2}{5}$	$\frac{3}{4}$ or $\frac{8}{12}$	$\frac{16}{25}$ or $\frac{3}{5}$	$\frac{3}{4}$ or $\frac{18}{20}$
$\frac{4}{6}$ or $\frac{7}{12}$	$\frac{10}{21}$ or $\frac{3}{7}$	$\frac{6}{8}$ or $\frac{15}{24}$	$\frac{14}{27}$ or $\frac{5}{9}$	$\frac{15}{20}$ or $\frac{7}{10}$
$\frac{14}{40}$ or $\frac{3}{10}$	$\frac{3}{8}$ or $\frac{10}{40}$	$\frac{29}{36}$ or $\frac{5}{6}$	$\frac{12}{14}$ or $\frac{20}{28}$	$\frac{22}{36}$ or $\frac{7}{12}$

### Answer GRID

$\frac{15}{24}$	$\frac{3}{5}$	$\frac{2}{21}$	$\frac{3}{7}$	$\frac{3}{28}$
$\frac{8}{12}$	$\frac{1}{3}$	$\frac{2}{3}$	$\frac{7}{12}$	$\frac{1}{7}$
$\frac{1}{6}$	$\frac{10}{40}$	$\frac{14}{27}$	$\frac{1}{4}$	$\frac{7}{10}$
$\frac{6}{7}$	$\frac{7}{12}$	$\frac{5}{9}$	$\frac{29}{36}$	$\frac{1}{5}$
$\frac{3}{10}$	$\frac{9}{10}$	$\frac{20}{28}$	$\frac{2}{5}$	$\frac{3}{4}$

- 2 Find the smaller fraction and cross it off in the answer grid. Circle the remaining 5.

$\frac{2}{4}$ or $\frac{5}{6}$	$\frac{6}{8}$ or $\frac{4}{6}$	$\frac{5}{8}$ or $\frac{6}{10}$	$\frac{4}{10}$ or $\frac{2}{6}$	$\frac{3}{10}$ or $\frac{1}{4}$
$\frac{2}{6}$ or $\frac{2}{9}$	$\frac{3}{5}$ or $\frac{5}{7}$	$\frac{5}{6}$ or $\frac{4}{5}$	$\frac{6}{8}$ or $\frac{4}{5}$	$\frac{7}{11}$ or $\frac{2}{3}$
$\frac{7}{12}$ or $\frac{5}{8}$	$\frac{9}{11}$ or $\frac{7}{9}$	$\frac{8}{14}$ or $\frac{6}{10}$	$\frac{9}{27}$ or $\frac{5}{18}$	$\frac{7}{12}$ or $\frac{9}{15}$
$\frac{11}{15}$ or $\frac{13}{18}$	$\frac{4}{12}$ or $\frac{5}{16}$	$\frac{12}{14}$ or $\frac{8}{9}$	$\frac{5}{7}$ or $\frac{12}{15}$	$\frac{21}{25}$ or $\frac{9}{15}$

### Answer GRID

$\frac{7}{12}$	$\frac{1}{4}$	$\frac{4}{15}$	$\frac{6}{10}$	$\frac{7}{11}$
$\frac{2}{6}$	$\frac{1}{14}$	$\frac{7}{12}$	$\frac{3}{5}$	$\frac{9}{15}$
$\frac{4}{5}$	$\frac{12}{14}$	$\frac{6}{8}$	$\frac{2}{4}$	$\frac{5}{16}$
$\frac{13}{16}$	$\frac{7}{9}$	$\frac{5}{7}$	$\frac{7}{13}$	$\frac{4}{6}$
$\frac{13}{18}$	$\frac{2}{9}$	$\frac{8}{14}$	$\frac{11}{24}$	$\frac{5}{18}$

## Key idea

A fraction greater than 1 can be written in two ways

Improper fraction  $\frac{7}{4} =$    $= 1\frac{3}{4}$  Mixed number

1. Change the improper fractions to mixed numbers:

a)  $\frac{9}{4} =$

b)  $\frac{25}{3} =$

c)  $\frac{48}{5} =$

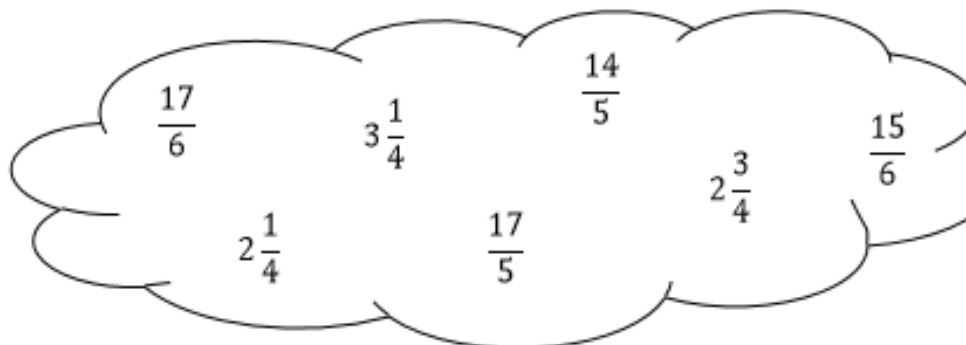
2. Change the mixed numbers into improper fractions:

a)  $8\frac{1}{4} =$

b)  $3\frac{4}{5} =$

c)  $2\frac{5}{3} =$

3. Put these fractions in descending order:



Question 1: Match up the improper fractions and mixed numbers.

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

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

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

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

$$\frac{7}{4}$$

$$\frac{11}{3}$$

$$\frac{7}{3}$$


$$\frac{9}{4}$$

Question 2: Arrange these improper fractions in order, starting with the smallest.

$$\frac{23}{4}, \frac{37}{7}, \frac{11}{2}$$

Question 3: Write down a mixed number between  $3\frac{3}{11}$  and  $3\frac{2}{5}$




 **START!** 1

$1\frac{4}{5} = \frac{8}{5}$	$\frac{12}{5} = 2\frac{2}{5}$	$2\frac{2}{7} = \frac{17}{7}$	$\frac{19}{5} = 3\frac{3}{5}$	$4\frac{1}{2} = \frac{9}{2}$
$\frac{14}{3} = 4\frac{2}{3}$	$5\frac{1}{4} = \frac{21}{4}$	$\frac{19}{3} = 6\frac{2}{3}$	$4\frac{2}{3} = \frac{14}{3}$	$\frac{29}{5} = 5\frac{4}{5}$
$5\frac{3}{7} = \frac{38}{7}$	$\frac{27}{4} = 6\frac{2}{4}$	$5\frac{5}{6} = \frac{34}{6}$	$\frac{38}{5} = 7\frac{3}{5}$	$5\frac{7}{8} = \frac{47}{8}$
$\frac{31}{4} = 7\frac{3}{4}$	$4\frac{5}{7} = \frac{33}{7}$	$\frac{32}{3} = 10\frac{2}{3}$	$7\frac{6}{11} = \frac{84}{11}$	$\frac{57}{10} = 5\frac{7}{10}$
$5\frac{3}{4} = \frac{26}{4}$	$\frac{44}{12} = 3\frac{7}{12}$	$6\frac{2}{11} = \frac{68}{11}$	$\frac{61}{9} = 6\frac{7}{9}$	$6\frac{4}{5} = \frac{33}{5}$

**FINISH!**

Challenge:

## Make Your Own Maze!

 **START!**


**FINISH!**

## Week 5: Fractions

- LI: Add and subtract fractions including mixed numbers

### Demonstration Videos:

<https://corbettmaths.com/2013/02/15/adding-fractions-same-denominator/>

<https://corbettmaths.com/2012/08/21/fractions-addition-and-subtraction/>

**EXAMPLE**

What common denominator could we use?

Numerator & Denominator  $\times 5$

Numerator & Denominator  $\times 4$

$$\frac{1}{4} + \frac{3}{5} = \frac{5}{20} + \frac{12}{20} = \frac{17}{20}$$




Numerator & Denominator  $\times 5$

Numerator & Denominator  $\times 4$

$$\frac{3}{4} - \frac{2}{5} = \frac{15}{20} - \frac{8}{20} = \frac{7}{20}$$

### Tasks:

★		★★		★★★	
1)	$\frac{1}{3} + \frac{1}{3}$	1)	$\frac{2}{3} + \frac{1}{6}$	1)	$\frac{1}{3} + \frac{1}{4}$
2)	$\frac{2}{5} + \frac{1}{5}$	2)	$\frac{1}{8} + \frac{1}{4}$	2)	$\frac{2}{5} + \frac{1}{3}$
3)	$\frac{1}{7} + \frac{3}{7}$	3)	$\frac{3}{5} + \frac{1}{10}$	3)	$\frac{4}{5} + \frac{1}{6}$
4)	$\frac{1}{8} + \frac{5}{8}$	4)	$\frac{1}{3} + \frac{7}{12}$	4)	$\frac{2}{3} + \frac{1}{5}$
5)	$\frac{2}{7} + \frac{5}{7}$	5)	$\frac{4}{5} + \frac{1}{15}$	5)	$\frac{4}{9} + \frac{1}{2}$
6)	$\frac{1}{9} + \frac{7}{9}$	6)	$\frac{3}{10} + \frac{7}{20}$	6)	$\frac{1}{7} + \frac{3}{8}$

		
1) $\frac{2}{3} - \frac{1}{3}$	1) $\frac{2}{3} - \frac{1}{6}$	1) $\frac{1}{3} - \frac{1}{4}$
2) $\frac{4}{5} - \frac{2}{5}$	2) $\frac{5}{8} - \frac{1}{4}$	2) $\frac{4}{5} - \frac{1}{3}$
3) $\frac{4}{7} - \frac{3}{7}$	3) $\frac{3}{5} - \frac{1}{10}$	3) $\frac{3}{5} - \frac{1}{6}$
4) $\frac{7}{8} - \frac{5}{8}$	4) $\frac{1}{3} - \frac{2}{12}$	4) $\frac{2}{3} - \frac{1}{5}$
5) $\frac{3}{7} - \frac{2}{7}$	5) $\frac{4}{5} - \frac{1}{15}$	5) $\frac{7}{9} - \frac{1}{2}$
6) $\frac{7}{9} - \frac{3}{9}$	6) $\frac{7}{10} - \frac{7}{20}$	6) $\frac{6}{7} - \frac{3}{8}$

1. Calculate:

a)  $3\frac{1}{7} + \frac{2}{7} =$

e)  $3\frac{2}{9} + 3\frac{1}{3} =$

b)  $5\frac{1}{3} + \frac{1}{9} =$

f)  $3\frac{1}{6} + 2\frac{2}{9} =$

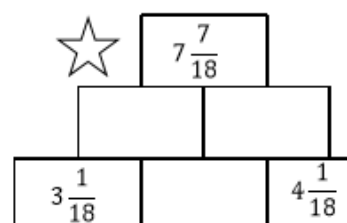
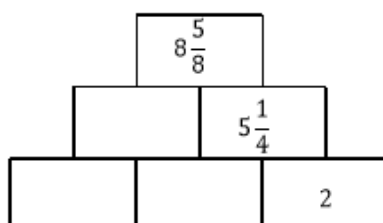
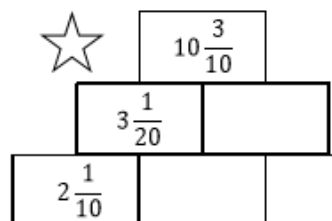
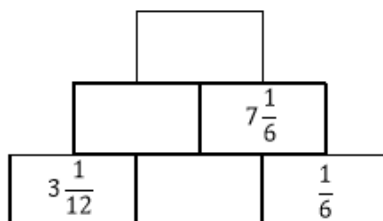
c)  $4\frac{1}{6} - \frac{1}{9} =$

g)  $3\frac{1}{3} - 2\frac{1}{6} =$

d)  $2\frac{1}{3} + 3\frac{1}{6} =$

h)  $3\frac{5}{6} - 2\frac{2}{9} =$

2. The sum of the two bricks is equal to the brick above.  
Complete the pyramids below:



## Concept corner

Think about this calculation:

$$3\frac{4}{5} + \frac{1}{3}$$

Two students have calculated this sum and written their working out in full:

$$\begin{aligned} 3\frac{4}{5} + \frac{1}{3} &= 3\frac{12}{15} + \frac{5}{15} \\ &= 3\frac{17}{15} \\ &= 4\frac{2}{15} \end{aligned}$$

$$\begin{aligned} 3\frac{4}{5} + \frac{1}{3} &= \frac{19}{5} + \frac{1}{3} \\ &= \frac{57}{15} + \frac{5}{15} \\ &= \frac{62}{15} \end{aligned}$$

What is the same and what is different between these methods of calculation?

Check to see if  $4\frac{2}{15}$  and  $\frac{62}{15}$  are equal.

3. Complete the following calculations:

a)  $2\frac{2}{3} + \frac{5}{6} =$

d)  $5\frac{4}{5} + 2\frac{1}{4} =$

b)  $\frac{4}{5} + 3\frac{7}{10} =$

e)  $3\frac{5}{9} + 2\frac{5}{6} =$

c)  $\frac{5}{6} + 5\frac{3}{4} =$

f)  $2\frac{2}{3} + 4\frac{5}{7} =$

## Concept corner

Think about this calculation:

$$3\frac{1}{4} - \frac{2}{3}$$

Two students have calculated this subtraction and written their working out in full:

$$\begin{aligned} 3\frac{1}{4} - \frac{2}{3} &= 3\frac{3}{12} - \frac{8}{12} \\ &= 3 + \frac{3}{12} - \frac{8}{12} \\ &= 3 + \left(-\frac{5}{12}\right) \\ &= 2\frac{7}{12} \end{aligned}$$

$$\begin{aligned} 3\frac{1}{4} - \frac{2}{3} &= \frac{13}{4} - \frac{2}{3} \\ &= \frac{39}{12} - \frac{8}{12} \\ &= \frac{31}{12} \\ &= 2\frac{7}{12} \end{aligned}$$

What is the same and what is different between these methods of calculation?

4. Complete the following calculations:

a)  $4\frac{1}{6} - \frac{2}{3} =$

b)  $3\frac{1}{5} - \frac{2}{3} =$

c)  $5\frac{2}{3} - 2\frac{5}{6} =$

## Challenge:



9. Bucket A contained  $3\frac{7}{12}$  litres of water.

Bucket B contained  $1\frac{2}{3}$  litres less water than bucket A

Bucket C contained  $\frac{5}{6}$  litres less water than bucket B.

The water in the three buckets was poured into a large container.

How much water is in the container?



## Week 6: Problem Solving

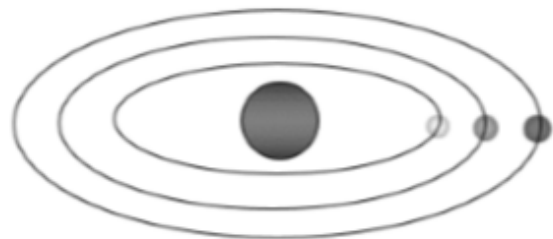
- **LI: Apply knowledge of multiples, factors, primes and fractions to worded and diagram problems**

Recap Demonstration Videos on HCF, LCM and Fractions for help with the following tasks

Tasks:

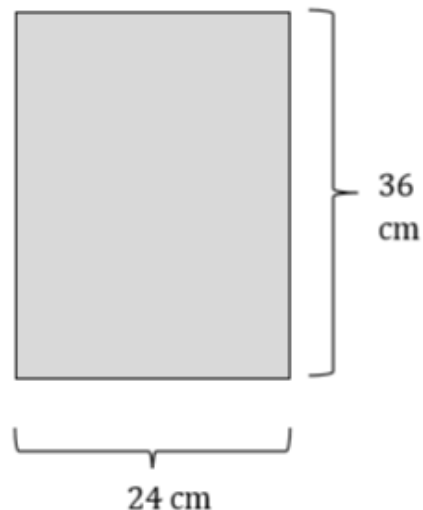
1. Rebecca and Sally were each given a piece of ribbon of equal length. Rebecca cut her ribbon into equal lengths of 8 m, while Sally cut her ribbon into equal lengths of 6 m. If there was no ribbon leftover, find the shortest possible length of ribbon given to them.
2. Two buses leave the depot at 8:30 am. The number 13 bus leaves every 15 minutes and the number 100 bus leaves every 20 minutes. When do they next leave the depot at the same time?

3. Imagine that it is the year 3000. Three planets orbit a star and are lined up as shown in the diagram. These planets take 8, 9 and 10 Earth months respectively to orbit their star. In what year will all three planets be lined up again in the same position?

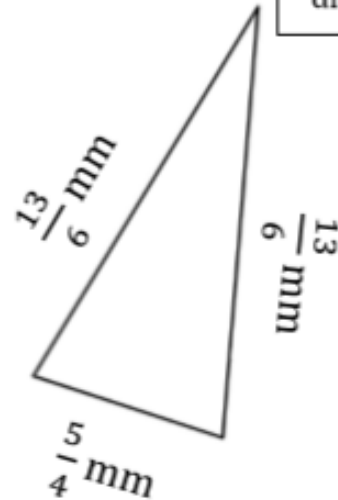
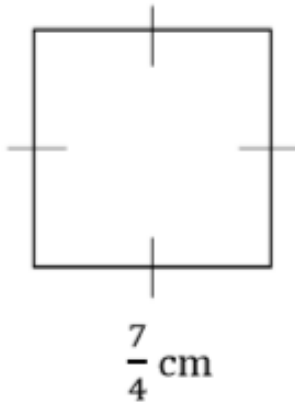


4. We want to cut the equal sized squares from this sheet of paper.

What should the length of the sides of the largest square be so there will not be any paper left over?



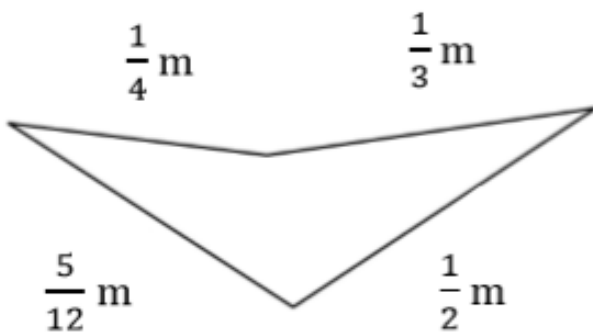
1. Calculate the perimeters of the following shapes, expressing your answer in its simplest term.



Diagrams not  
drawn accurately

Perimeter = .....

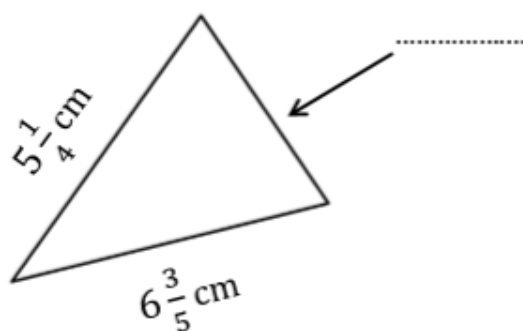
Perimeter = .....



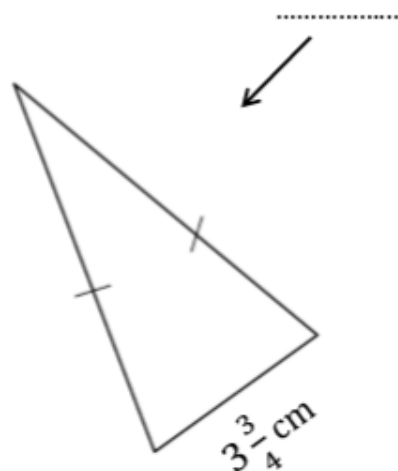
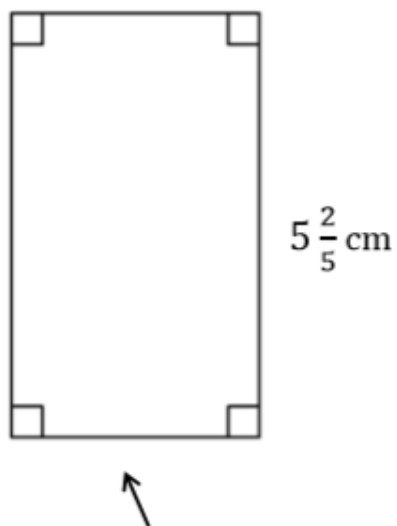
2. You are given the perimeter of each shape.  
Calculate the length of the labelled sides:

Diagrams not  
drawn accurately

Perimeter =  $14\frac{7}{20}$  cm



Perimeter = 15.3 cm



Perimeter = 9.5 cm

3. Ian wins  $\pounds 2\frac{1}{4}$  million. He gives  $\pounds \frac{3}{5}$  million to charity and  $\pounds \frac{1}{8}$  million to his friends and family. How much does he have left from the winnings?

4. Which of the following is greater and by how much?

A: The difference between  $8\frac{1}{8}$  and  $4\frac{1}{3}$

B: The sum of  $1\frac{1}{3}$  and  $2\frac{2}{5}$

5. In a magic square the rows, columns and diagonals all add up to the same number. This is called a 'magic number'.

Complete the magic square below:

	$\frac{2}{10}$	$1\frac{1}{5}$
	1	
	$1\frac{4}{5}$	

What is the magic number? .....

Challenge:



6. To complete the magic square below let  $a = \frac{2}{5}$ ,  $b = 3\frac{1}{5}$ ,  $c = 2\frac{1}{3}$

$a - b$	$a - c$	$a + b + c$
$a - c + b$	$a - b + c$	$a$
$a + c$	$a + b$	$a - b - c$

What is the magic number? .....

7. In each set below, which is the greatest?

$$11\frac{7}{8} \text{ or } 11.66 \text{ or } \frac{96}{8}$$

$$\frac{2}{3} + \frac{3}{4} \text{ or } 0.75 \text{ or } \frac{38}{20} - 1$$

$$2\frac{3}{5} + 2.43 \text{ or } \frac{23}{5} + 0.17 \text{ or } 6.25 - \frac{3}{8}$$

$$7.2 - 2\frac{1}{2} \text{ or } 1\frac{2}{5} + 2.67 \text{ or } 7.22 - \frac{8}{3}$$

Assessment Ladder