Name ANSWERS	Class

MATHS TEACHER HUB

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HCF and LCM

(9 – 1) Topic booklet

Higher

These questions have been collated from previous years GCSE Mathematics papers.

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- You must **show all your working out.**
- If the question is a **1H** question you are not allowed to use a calculator.
- If the question is a **2H** or a **3H** question, you may use a calculator to help you answer.

Information

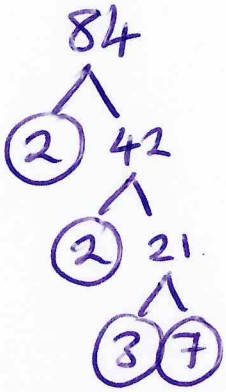
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Answer ALL questions
Write your answers in the space provided.
You must write down all the stages in your working.

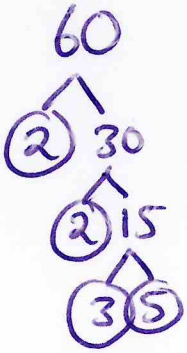
1 (a) Write 84 as a product of its prime factors.

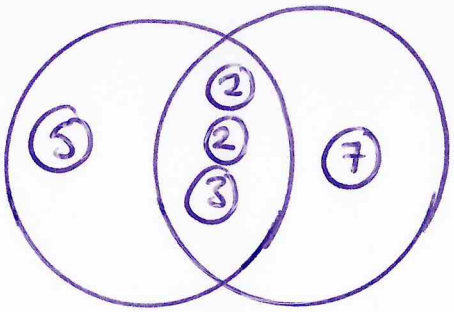


$2 \times 2 \times 3 \times 7$
or
$2^3 \times 3 \times 7$

(2)

(b) Find the lowest common multiple (LCM) of 60 and 84





LCM = $2 \times 2 \times 3 \times 5 \times 7$

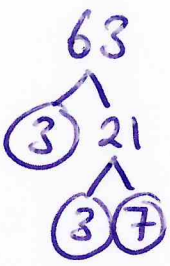
$= 420$

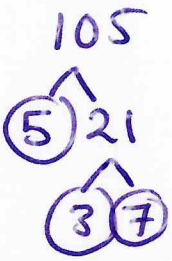
420

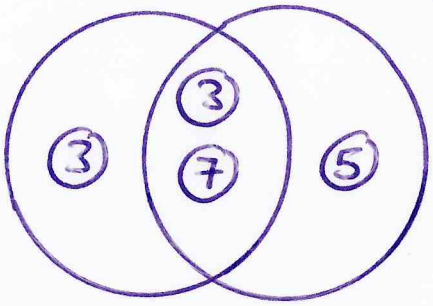
(2)

(Total for Question 1 is 4 marks)

1 Find the highest common factor (HCF) of 63 and 105







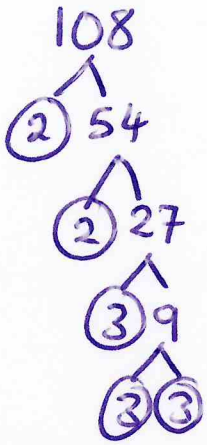
HCF = 3 × 7

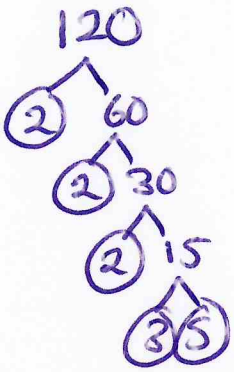
= 21

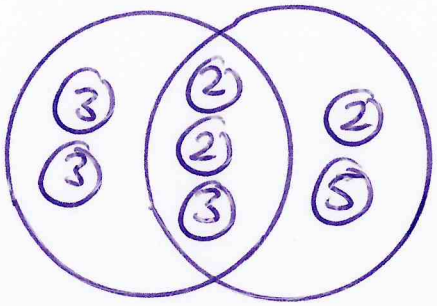
21

(Total for Question 1 is 2 marks)

1 Find the Lowest Common Multiple (LCM) of 108 and 120







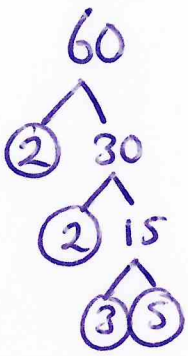
LCM = 2 × 2 × 2 × 3 × 3 × 3 × 5

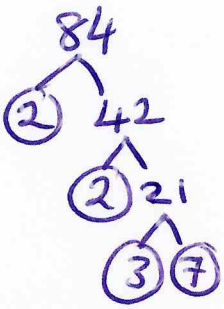
= 1080

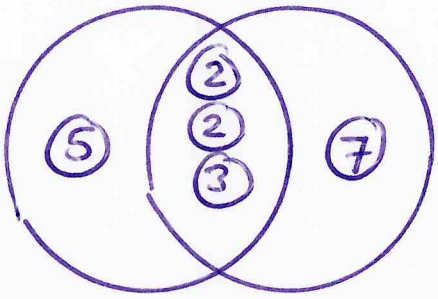
1080

(Total for Question 1 is 3 marks)

2 (a) Find the Highest Common Factor (HCF) of 60 and 84







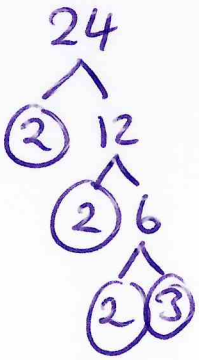
HCF = 2 × 2 × 3

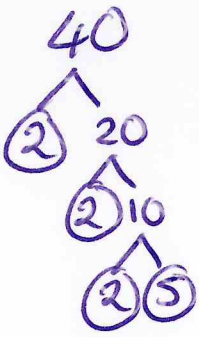
= 12

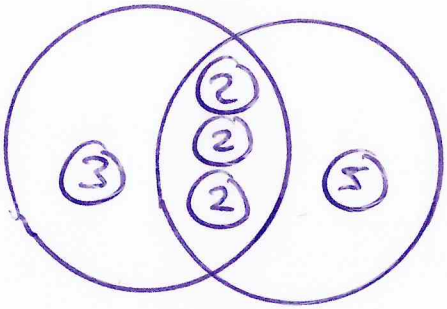
12

(2)

(b) Find the Lowest Common Multiple (LCM) of 24 and 40







LCM = 2 × 2 × 2 × 3 × 5

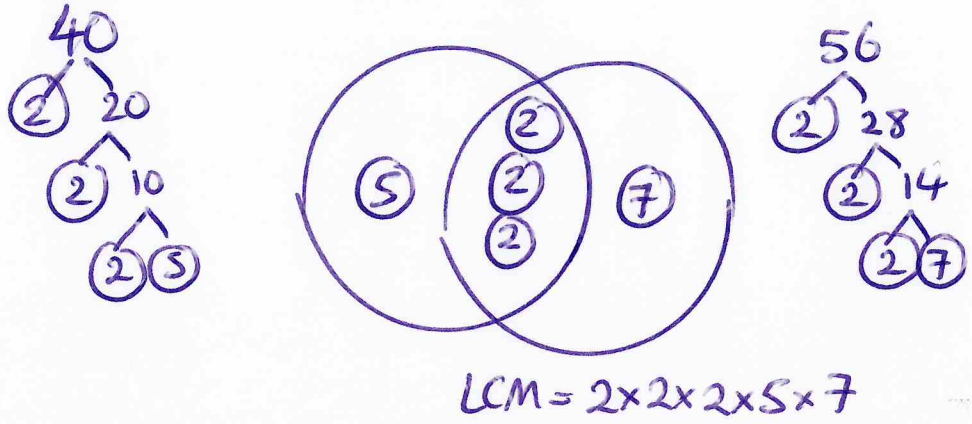
= 120

120

(2)

(Total for Question 2 is 4 marks)

2 (a) Find the lowest common multiple (LCM) of 40 and 56



LCM = 2×2×2×5×7

280

(2)

$A = 2^3 \times 3 \times 5$ $B = 2^2 \times 3 \times 5^2$

(b) Write down the highest common factor (HCF) of A and B.

A = 2×2×2×3×5

B = 2×2×3×5×5

HCF = 2×2×3×5

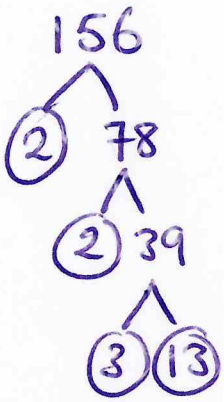
= 60

60

(1)

(Total for Question 2 is 3 marks)

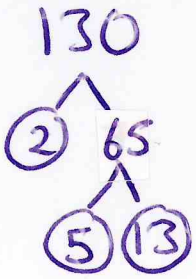
3 (a) Write 156 as a product of its prime factors.

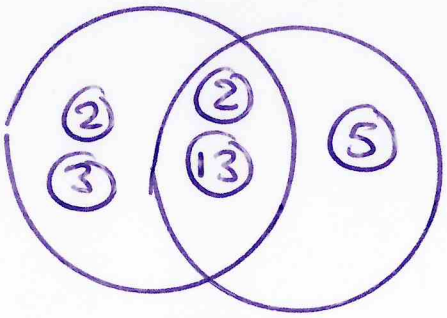


$2 \times 2 \times 3 \times 13$
or
$2^2 \times 3 \times 13$

(2)

(b) Find the highest common factor (HCF) of 156 and 130





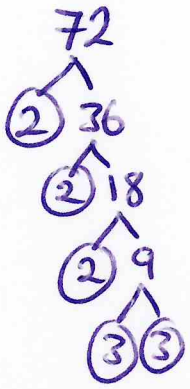
HCF = 2×13
$= 26$

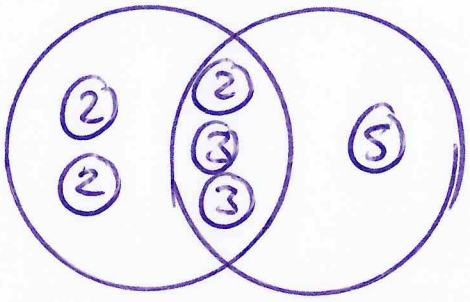
26

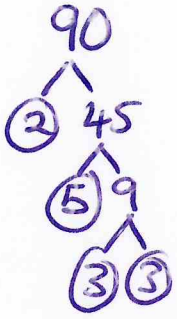
(2)

(Total for Question 3 is 4 marks)

3 Find the highest common factor (HCF) of 72 and 90







HCF = 2 × 3 × 3
= 18

18

June 2019 – Paper 1H **(Total for Question 3 is 2 marks)**

5 Ali buys packs of balloons and boxes of pencils.

There are 30 balloons in each pack.
There are 24 pencils in each box.

Ali buys exactly the same number of balloons and pencils.

Work out how many packs of balloons and how many boxes of pencils she could have bought.
You must show all your working.

30
60
90
4 = 120
150
180
210

24
48
72
96
5 = 120
144

4 packs of balloons

5 boxes of pencils

November 2023 – Paper 3H **(Total for Question 5 is 3 marks)**

5 A and B are numbers such that

$A = 2^2 \times 3^4 \times 7$
$B = 3^2 \times 7^2$

(a) Find the highest common factor (HCF) of A and B.

$A = 2 \times 2 \times 3 \times 3 \times 3 \times 3 \times 7$

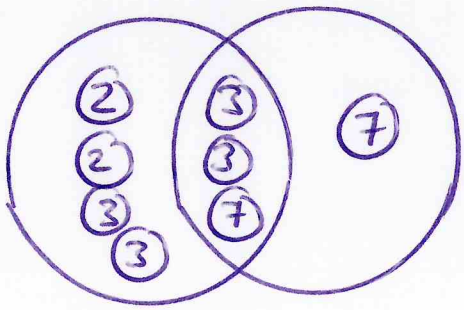
$B = 3 \times 3 \times 7 \times 7$

$HCF = 3 \times 3 \times 7$
$= 63$

63

(1)

(b) Find the lowest common multiple (LCM) of A and B.



$LCM = 2 \times 2 \times 3 \times 3 \times 3 \times 3 \times 7 \times 7$

$= 15876$

15876

(2)

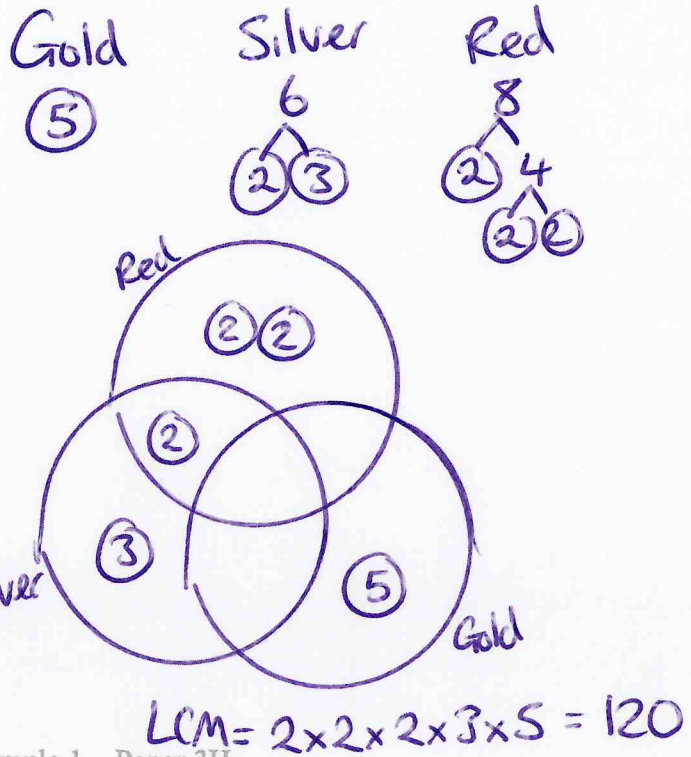
(Total for Question 5 is 3 marks)

6 Liz buys packets of coloured buttons.

There are 8 red buttons in each packet of red buttons.
There are 6 silver buttons in each packet of silver buttons.
There are 5 gold buttons in each packet of gold buttons.

Liz buys equal numbers of red buttons, silver buttons and gold buttons.

How many packets of each colour of buttons did Liz buy?



120 ÷ 8 = 15
120 ÷ 6 = 20
120 ÷ 5 = 24

15 packets of red buttons

20 packets of silver buttons

24 packets of gold buttons

Sample 1 – Paper 3H

(Total for Question 6 is 3 marks)

8 Two numbers m and n are such that
m is a multiple of 5
n is an even number
the highest common factor (HCF) of m and n is 7

Write down a possible value for m and a possible value for n.

$m = 5 \times 7 = 35$

$n = 14, 28, 42,$

$m =$ 35

$n =$ 14

November 2022 – Paper 1H

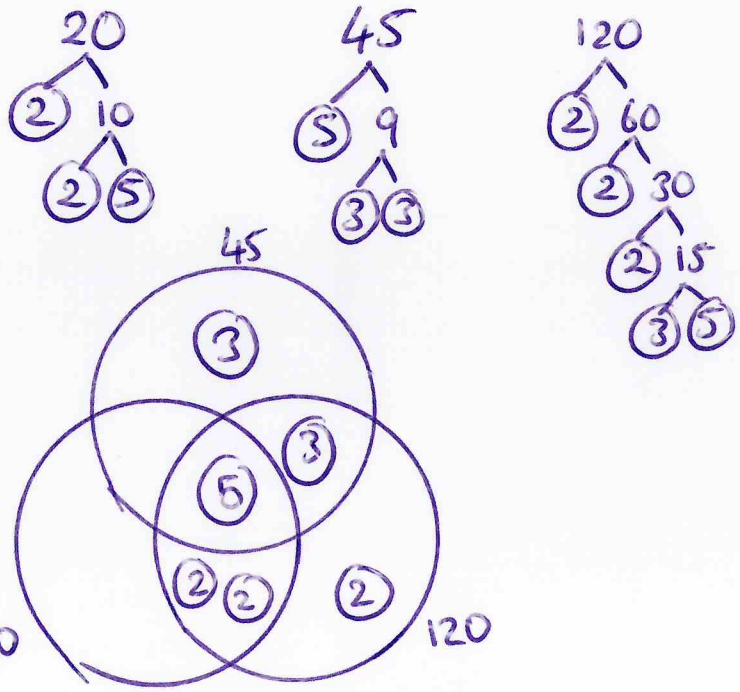
(Total for Question 8 is 2 marks)

10 Here are three lamps.

Lamp **A** flashes every 20 seconds.
Lamp **B** flashes every 45 seconds.
Lamp **C** flashes every 120 seconds.

The three lamps start flashing at the same time.

How many times in one hour will the three lamps flash at the same time?



LCM = 2×2×2×3×3×5

= 360

= 6 minutes

10 times

(Total for Question 10 is 3 marks)