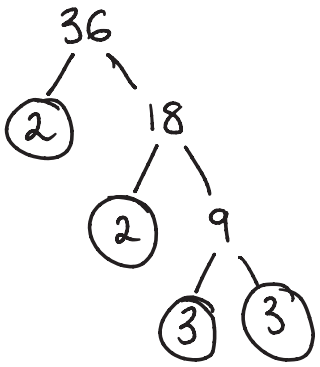
1. Write 36 as a product of its prime factors.



$2 \times 2 \times 3 \times 3$

(Total for Question is 2 marks)

Annie : Lily
4 : 3

4 + 3 = 7

$\frac{3}{7}$ ✓

Dan gets $\frac{1}{4}$
Rosie gets $\frac{3}{4}$

Rosie : Dan
$\frac{3}{4}$: $\frac{1}{4}$
(×4) (×4)
3 : 1

3 : 1 ✓

2. Steve says,

"There are more prime numbers between 20 and 30 than there are between 10 and 20"

Prime number is number divisible by only itself and 1

Is Steve right?
You must show how you get your answer.

10 to 20
11
13
17
19

= 4

20 to 30
23
29 ✓

= 2

No, Steve is not correct because there are 4 prime numbers between 10 and 20, but only 2 between 20 and 30 ✓

(Total for Question is 2 marks)

3758
7 > 5
Round up
= 4000

4000

= 1y + 3y - 2y
= 4y - 2y
= 2y

2y ✓

3. Write down all the factors of 18

1 × 18 = 18
2 × 9 = 18
3 × 6 = 18
~~4 × 4 5 = 18~~

1, 2, 3, 6, 9, 18 ✓ ✓

(Total for Question is 2 marks)

4. Nidah writes down two different prime numbers.

She adds together her two numbers.
Her answer is a square number less than 30

Find two prime numbers that Nidah could have written down.

Square numbers < 30

1 ×
4 ×
9
16
25

Prime Numbers

2 17
3 19
5 23
7 29
11
13

2 + 7 = 9
3 + 13 = 16
5 + 11 = 16
2 + 23 = 25

(Either)

2 7
3 13
5 11
2 23

2 , 23

(Total for Question is 2 marks)

Let x be Jim's number

$\frac{2}{3}x = 48$

$(\times 3)\quad(\times 3)$

$2x = 144$

$(\div 2)\quad(\div 2)$

$x = 72$

$\frac{5}{6} \times 72 = 60$

60

5. There are only blue pens, green pens and red pens in a box.

The ratio of the number of blue pens to the number of green pens is 2 : 5
The ratio of the number of green pens to the number of red pens is 4 : 1

There are less than 100 pens in the box.

What is the greatest possible number of red pens in the box?

B : G
2 : 5
(×4)
8 : 20

G : R
4 : 1
(×5)
20 : 5 ✓

8 + 20 + 5 = 33
3 × 33 = 99

B : G : R
8 : 20 : 5 ✓
(×3)
24 : 60 : 15

15 ✓

(Total for Question is 3 marks)

Let x be the reciprocal of 1·6

$x \times 1{\cdot}6 = 1$
$(\div 1{\cdot}6) \quad (\div 1{\cdot}6)$
$x = 0{\cdot}625$

0·625 ✓

Range of numbers which will:
Round up to 9·8
$9{\cdot}75 \leq x$
Round down to 9·8
$x < 9{\cdot}85$

$9{\cdot}75 \leq x < 9{\cdot}85$ ✓

$\frac{4}{16} \div \frac{4}{4} = \frac{1}{4}$ $\frac{3}{9} \div \frac{3}{3} = \frac{1}{3}$ $\frac{1}{3} \neq \frac{1}{4}$ can't be simplified to

fraction ÷ $\frac{\text{numerator}}{\text{numerator}}$ this is the same as dividing by 1, so doesn't affect the value of the fraction. it only simplifies it.

$\frac{2}{8} \div \frac{2}{2} = \frac{1}{4}$ They can never be equal as they are both in their simplest form

$\frac{3}{9}$

$\frac{15}{60} \div \frac{15}{15} = \frac{1}{4}$

6. Write down the first even multiple of 7

7, 14

7×1 odd

7×2 first even number

odd × even = even

14

(Total for Question is 1 mark)

1cm = 10mm ×10

35 × 10 = 350mm

350

7,700 ÷ 1000 = 7.7

1l = 1000ml ×1000

7.7

1kg = 1000g ×1000

0.32 × 1000 = 320

320

7. Margaret is thinking of a number.
She says,

"My number is odd. It is a factor of 36 and a multiple of 3"

There are two possible numbers Margaret can be thinking of.

Write down these two numbers.

Factor pairs of 36

~~1~~ ~~36~~
~~2~~ ~~18~~
3 ~~12~~
~~4~~ 9
~~6~~ ~~6~~

(1) Crossed out = evens and non multiples of 3

Stop here to avoid repeating factors unnecessarily.

3 (1) 9 (1)

(Total for Question is 3 marks)

8. (a) Write down all the prime numbers between 20 and 30

~~21~~ ~~22~~ (23) ~~24~~ ~~25~~ ~~26~~ ~~27~~ ~~28~~ (29)

x3 x5 x3 x2

23, 29

(2)

Catherine says,

"2 is the only even prime number."

multiple of 2

(b) Is Catherine right?
You must give a reason for your answer.

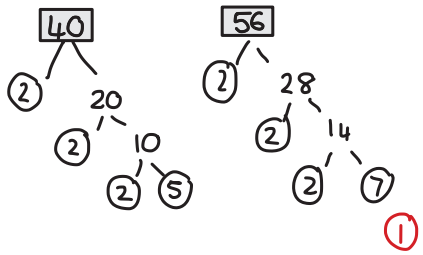
Yes, all other even numbers have 2 as a factor

(1)

(Total for Question is 3 marks)

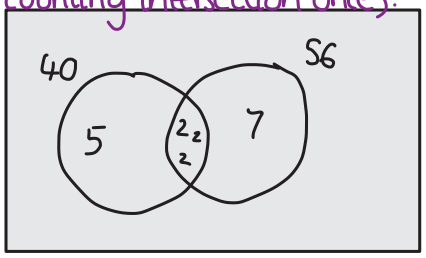
9. (a) Find the lowest common multiple (LCM) of 40 and 56

Prime Factorisation



(1)

LCM = Product of every number in the Venn diagram (only counting intersection once).



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

$= 280$

280 (1)

(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.

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

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

HCF = product of shared prime factors

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

60 (1)

(1)

(Total for Question is 3 marks)

10. Write down all the factors of 30

Factor Pairs:

1 × 30
2 × 15
3 × 10
5 × 6 ← Stop here
[6 × 5] we have already counted 5 and 6, so know we have found all factor pairs

1, 2, 3, 5, 6, 10, 15, 30

(Total for Question is 2 marks)

4 0 3 1 2

0.02, 0.152, 0.2, 0.37, 0.4 ✓

Decimal ×100 → Percentage

0.6 × 100
= 60%

60 ✓

11. Here is a list of numbers.

(10 ÷)	3	5	7	12	15	18	20
	$\frac{10}{3}$	2	$\frac{10}{7}$	$\frac{10}{12}$	$\frac{10}{15}$	$\frac{10}{18}$	$\frac{10}{20}$

From the list, write down a factor of 10

A factor is a number which will divide exactly into another number

5 ✓

(Total for Question is 1 mark)

7829

↓ 8>5 → Round up

8000

8000 ✓

$2g + 3h$

$= 2(9) + 3(4)$ ✓

$= 18 + 12$

$= 30$

30 ✓

12. Write down two prime numbers that have a sum of 32

Prime number → A number which is only divisible by itself and one

2	17
3	19
5	23
7	29
11	31
13	

$3 + 29 = 32$

$13 + 19 = 32$

(Either)

3 and 29

or 13 , 19 ✓✓

(Total for Question is 2 marks)

13. Write down two factors of 12

Factor → a number which another number can be divided by to give a whole number

3 , 4

(Total for Question is 1 mark)

Factor = a number which another number can be divided by to give a whole number

3 4 ✓

$\frac{1}{3}$

$\frac{1}{3} \times 30 = 10$

$30 \div 3$

10 ✓

$\frac{7}{10}$ ✓

14. Here is a list of numbers.

7 8 15 16 18 22

Write down the number from the list that is a multiple of 6

$18 \div 6 = 3$

18 ✓

(Total for Question is 1 mark)

15. Here is a list of numbers.

~~5~~ ~~11~~ 18 ~~22~~ ~~29~~

From the list, write down a multiple of 3

3, 6, 9, 12, 15, 18, 21, 24, 27, 30

18 ✓

(Total for Question is 1 mark)

16. Lucy uses a code to open a lock.

The code is a letter followed by a 2-digit number.

The letter is L or U.
The number is a prime number between 20 and 30

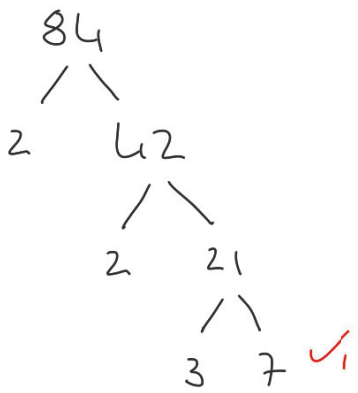
Write down all the possibilities for Lucy's code.

	23	29
L	L23	L29
U	U23	U29

✓1 ✓2

(Total for Question is 2 marks)

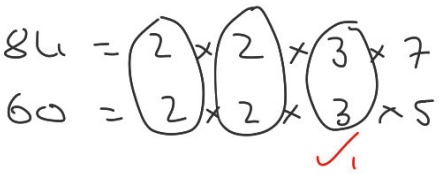
17. (a) Write 84 as a product of its prime factors.



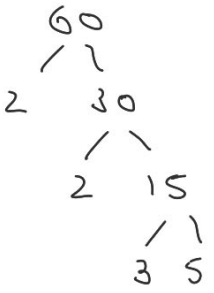
$2 \times 2 \times 3 \times 7$ ✓2

(2)

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



✓1



$LCM(60, 84) = 2 \times 2 \times 3 \times 5 \times 7$

$= 12 \times 5 \times 7$

$= 60 \times 7$

$= 420$

420 ✓2

(2)

(Total for Question is 4 marks)

18. Here is a list of whole numbers from 21 to 30

$5\times5=5^2=25$

21 22 23 24 25 26 27 28 29 30

(a) From the list, write down a square number.

$a\times a=a^2$

25 (1)

(1)

(b) From the list, write down a multiple of 8

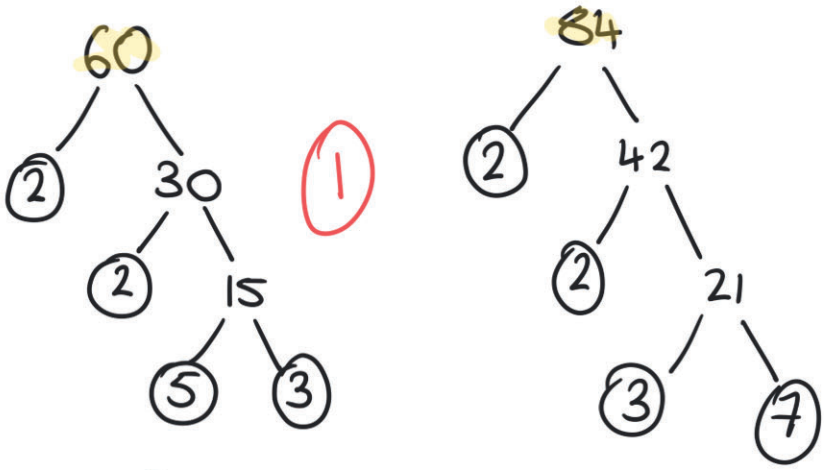
Any numbers in 8 times table → 8, 16, 24, 32...

24 (1)

(1)

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

Make factor tree for 60 and 84



(1)

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

$84 = 7 \times 3 \times 2 \times 2$ ← look for common numbers between both

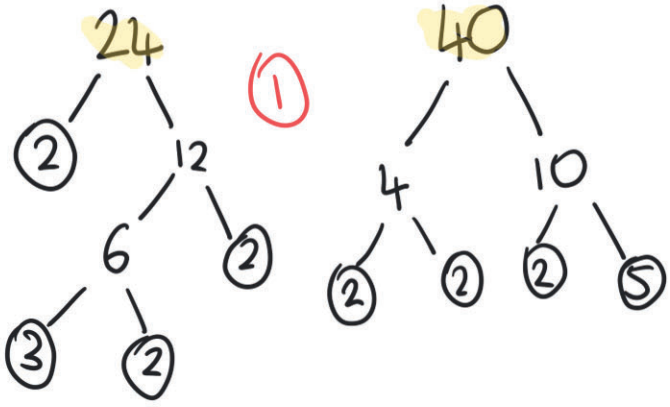
$HCF(60,84) = 2 \times 2 \times 3 = 12$

12 (1)

(2)

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

Make factor trees for 24 and 40



(1)

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

$40 = 2 \times 2 \times 2 \times 5$

$HCF(40,24) = 2 \times 2 \times 2 = 8$

$LCM(40,24) = 8 \times 3 \times 5 = 120$

(1) 120

(2)