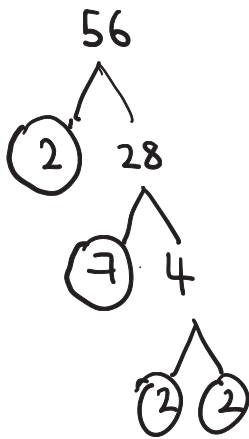


1. Express 56 as the product of its prime factors. → number which produces a given number when multiplied with another number
- ↳ multiplication    ↳ only factors are 1 and itself



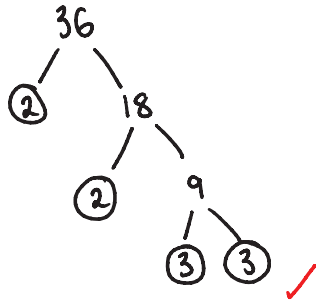
$$56 = 2 \times 2 \times 2 \times 7$$

$$= 2^3 \times 7$$

$$2^3 \times 7$$

(Total for Question is 2 marks)

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



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

(Total for Question is 2 marks)

3. 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?

$$B : G$$

$$2 : 5$$

$$(\times 4)$$

$$8 : 20$$

$$G : R$$

$$4 : 1$$

$$(\times 5)$$

$$20 : 5$$

$$8 + 20 + 5 = 33$$

$$3 \times 33 = 99$$

$$B : G : R$$

$$8 : 20 : 5$$

$$(\times 3)$$

$$24 : 60 : 15$$

15

(Total for Question is 3 marks)

Let  $x$  be the reciprocal of 1.6

$$x \times 1.6 = 1$$

$$(\div 1.6) \quad (\div 1.6)$$

$$x = 0.625$$

0.625

Range of numbers which will:

Round up to 9.8

$$9.75 \leq x$$

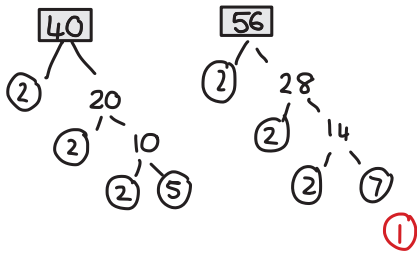
Round down to 9.8

$$x < 9.85$$

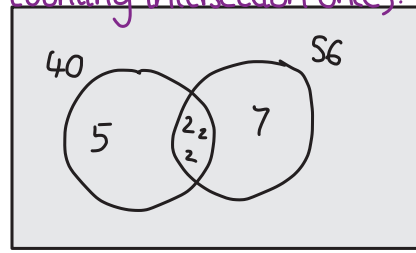
$$9.75 \leq x < 9.85$$

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

Prime Factorisation



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



$$\begin{aligned} \text{LCM} &= 2 \times 2 \times 2 \times 5 \times 7 \\ &= 280 \end{aligned}$$

$$\begin{array}{r} 280 \text{ (1)} \\ \hline \text{(2)} \end{array}$$

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

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

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



$$\begin{aligned} A &= \cancel{2} \times \cancel{2} \times 2 \times \cancel{3} \times \cancel{5} \\ B &= \cancel{2} \times \cancel{2} \times \cancel{3} \times \cancel{5} \times 5 \end{aligned}$$

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

HCF = product of shared prime factors

$$\begin{array}{r} 60 \\ \hline \text{(1)} \end{array}$$

(Total for Question is 3 marks)

5. Here are three lamps.

lamp A

lamp B

lamp C



Lamp A flashes every 20 seconds.

Lamp B flashes every 45 seconds.

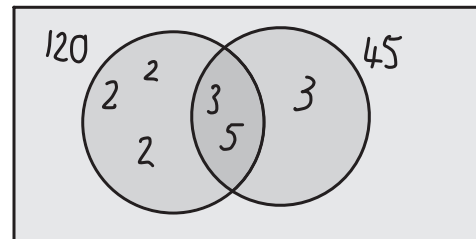
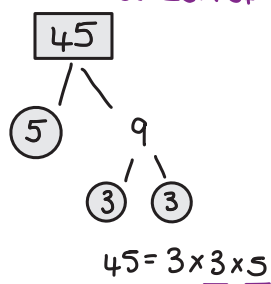
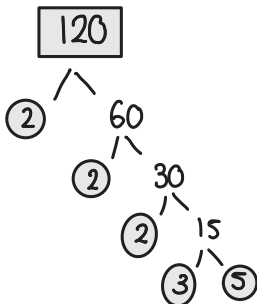
Lamp C flashes every 120 seconds.

120 is a multiple of 20, so every time C flashes, A will too

The three lamps start flashing at the same time.

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

Prime Factorisation to find LCM of 120, 45 and 20.



$120 = 2 \times 2 \times 2 \times 3 \times 5$  (1)

multiply every value in the venn diagram.

Lowest common multiple (LCM) =  $2 \times 2 \times 2 \times 3 \times 5 \times 3 = 360$  (1)

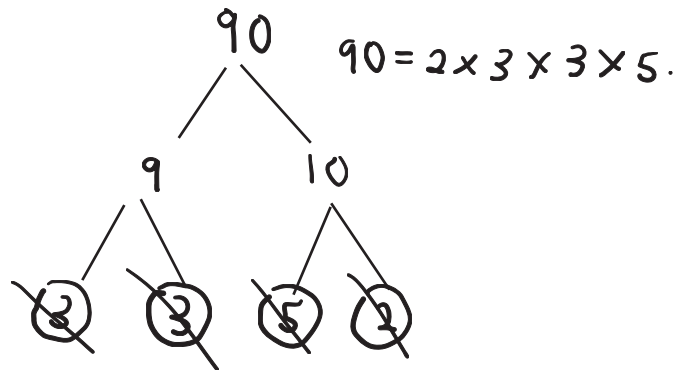
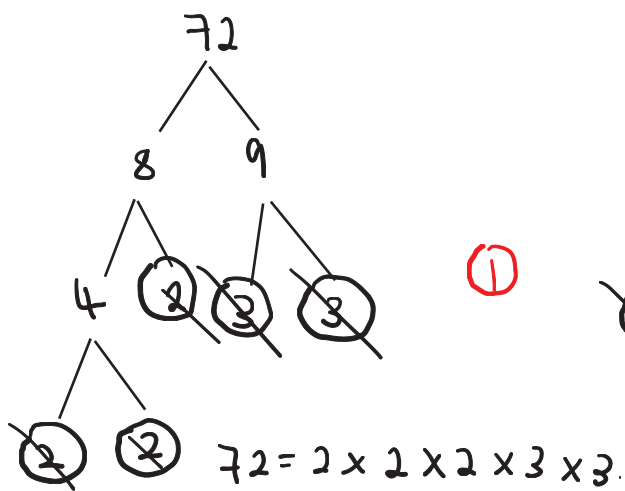
1 hour =  $60 \times 60 = 3600$  seconds

$3600 \div 360 = 10$  times

10 (1)

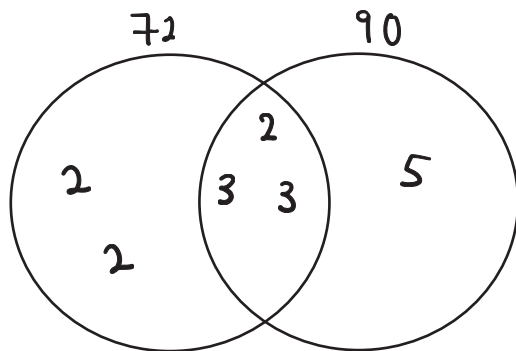
(Total for Question is 3 marks)

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



18

(Total for Question is 2 marks)



To find HCF, multiply the values in the intersection.

$HCF = 2 \times 3 \times 3 = 18$

①

7. There are some small cubes and some large cubes in a bag.  
The cubes are red or the cubes are yellow.

The ratio of the number of small cubes to the number of large cubes is 4:7 (11 parts)

The ratio of the number of red cubes to the number of yellow cubes is 3:5 (8 parts)

- (a) Explain why the least possible number of cubes in the bag is 88

Because the LCM of 11 and 8 is 88.

(1)

(1)

All the small cubes are yellow.

- (b) Work out the least possible number of large yellow cubes in the bag.

Least possible number of cubes = 88.

	SMALL	LARGE	TOTAL
RED	0	33	33
YELLOW	32	23	55
TOTAL	32	56	88

$$S:L = 4:7$$

$$R:Y = 3:5$$

(1)

$$\text{Total number of small cubes} = \frac{4}{11} \times 88 = 32$$

$$\text{Total number of large cubes} = \frac{7}{11} \times 88 = 56$$

$$\text{Total number of red cubes} = \frac{3}{8} \times 88 = 33$$

$$\text{Total number of yellow cubes} = \frac{5}{8} \times 88 = 55$$

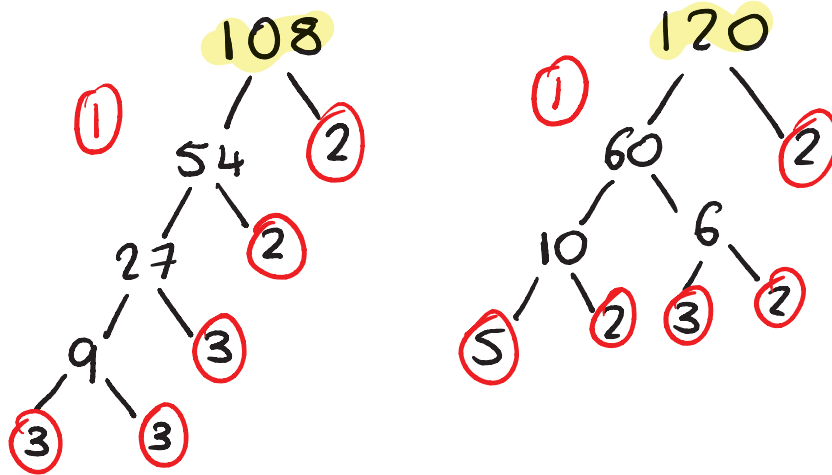
(1)

23

(3)

(Total for Question is 4 marks)

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



$$120 = 2 \times 2 \times 3 \times 2 \times 5$$

$$108 = 2 \times 2 \times 3 \times 3 \times 3$$

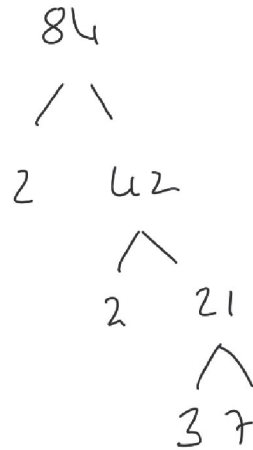
$$\text{HCF}(120, 108) = 2 \times 2 \times 3 = 12$$

$$\text{LCM}(120, 108) = 12 \times 2 \times 5 \times 3 \times 3 = 1080$$

1080<sup>(1)</sup>



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



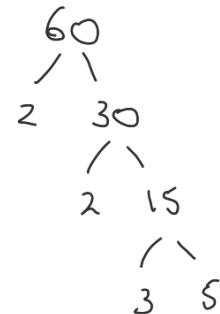
$$2 \times 2 \times 3 \times 7$$

(2)

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

$$\begin{array}{l}
 60 = 2 \times 2 \times 3 \times 5 \\
 84 = 2 \times 2 \times 3 \times 7
 \end{array}$$

$$\begin{aligned}
 \text{LCM}(60, 84) &= 2 \times 2 \times 3 \times 5 \times 7 \\
 &= 12 \times 5 \times 7 \\
 &= 60 \times 7 = 420
 \end{aligned}$$



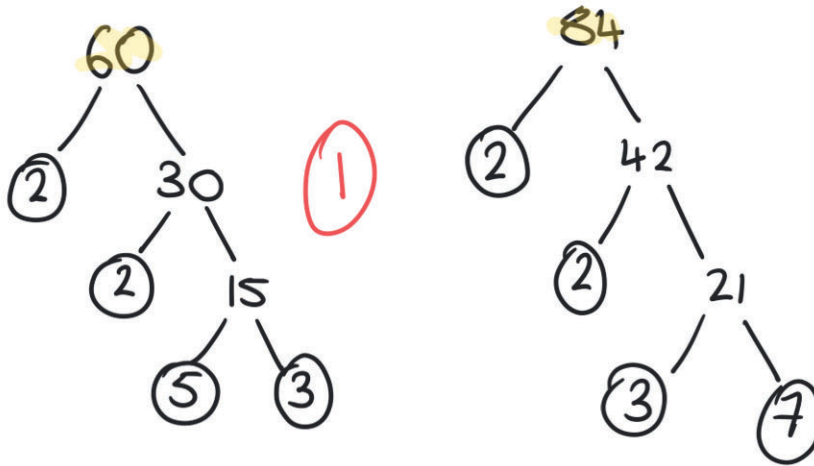
$$420$$

(2)

(Total for Question is 4 marks)

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

Make factor tree for 60 and 84



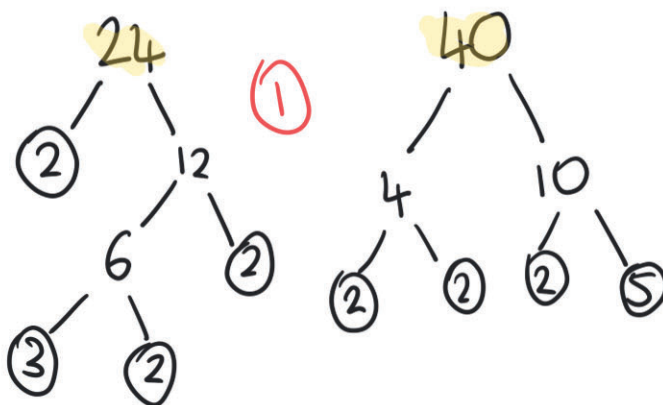
$60 = 3 \times 5 \times 2 \times 2$   
 $84 = 7 \times 3 \times 2 \times 2$   
 $HCF(60, 84) = 2 \times 2 \times 3 = 12$

*Look for common numbers between both*

$12$  (1)  
 -----  
 (2)

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

Make factor trees for 24 and 40



$24 = 2 \times 2 \times 2 \times 3$   
 $40 = 2 \times 2 \times 2 \times 5$   
 $HCF(40, 24) = 2 \times 2 \times 2 = 8$   
 $LCM(40, 24) = 8 \times 3 \times 5 = 120$

$120$  (1)  
 -----  
 (2)