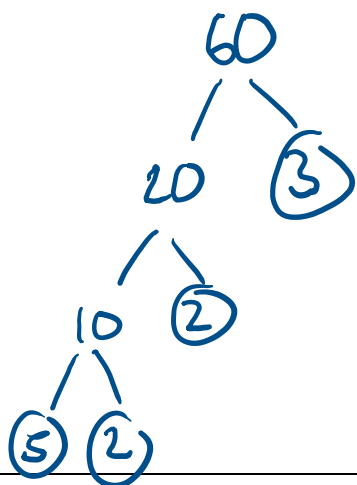




## HCF and LCM Exam Practice

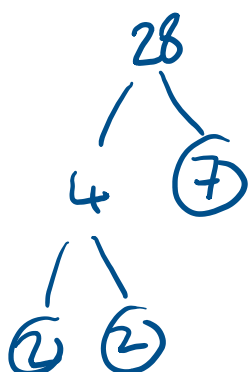
### Writing a Number as Products of Prime Factors

1. Write 60 as a product of its prime factors.



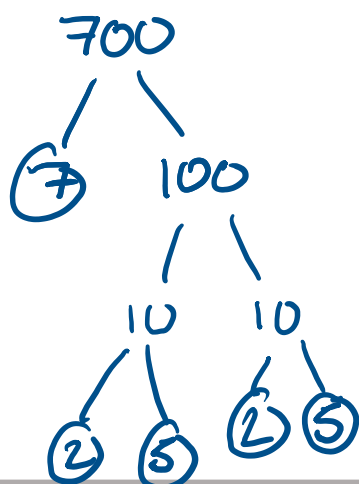
Answer:  $2^2 \times 3 \times 5$   
(2 marks)

2. Write 28 as a product of its prime factors.



Answer:  $2^2 \times 7$   
(2 marks)

3. Write 700 as a product of its prime factors.

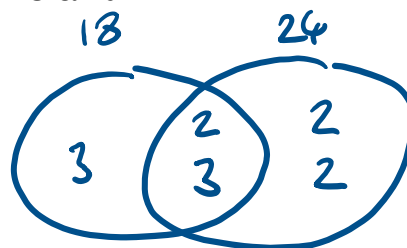
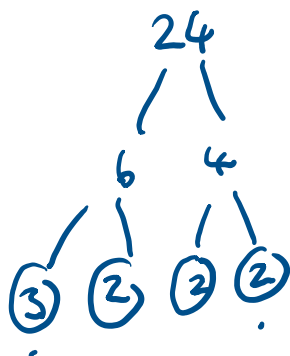


Answer:  $2^2 \times 5^2 \times 7$   
(2 marks)



## Highest Common Factor (HCF)

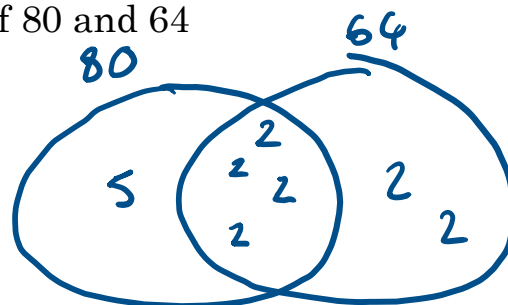
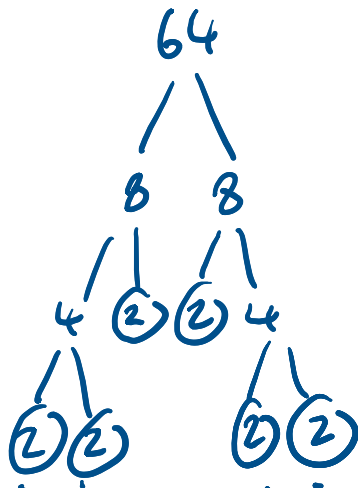
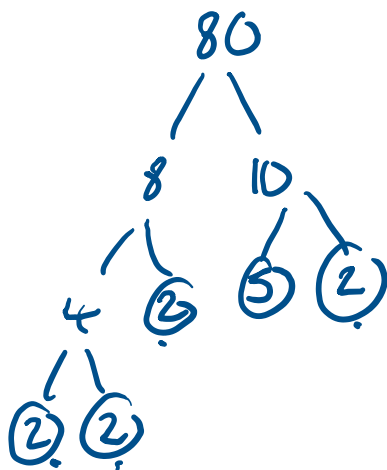
4. Find the highest common factor (HCF) of 18 and 24



$$2 \times 3 = 6$$

Answer: 6  
(2 marks)

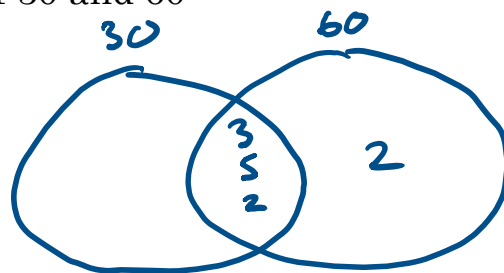
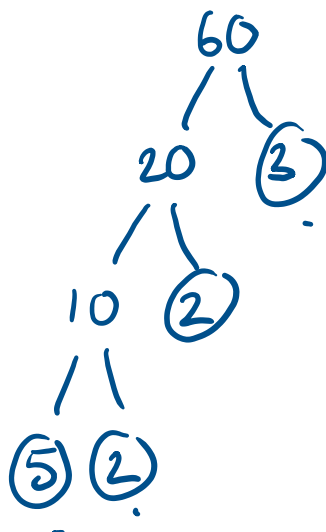
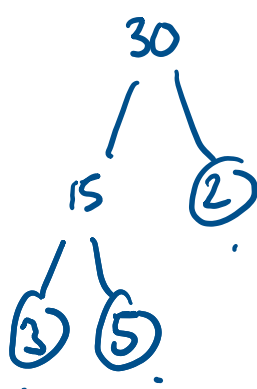
5. Find the highest common factor (HCF) of 80 and 64



$$2 \times 2 \times 2 \times 2 = 16$$

Answer: 16  
(2 marks)

6. Find the highest common factor (HCF) of 30 and 60



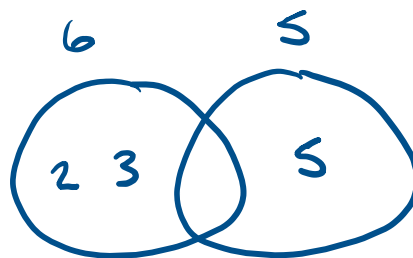
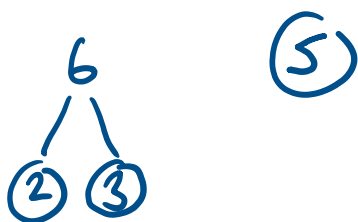
$$3 \times 5 \times 2 = 30$$

Answer: 30  
(2 marks)



## Lowest Common Multiple (LCM):

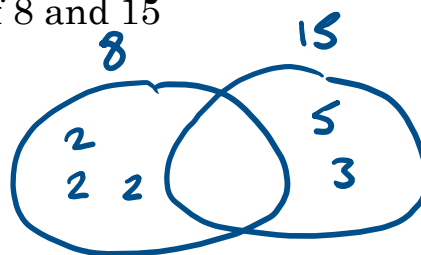
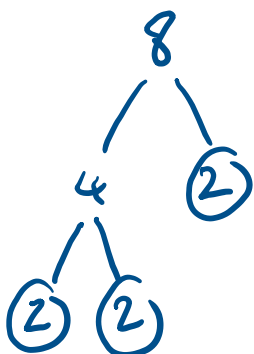
7. Find the lowest common multiple (LCM) of 6 and 5



$$2 \times 3 \times 5 = 30$$

Answer: 30  
(2 marks)

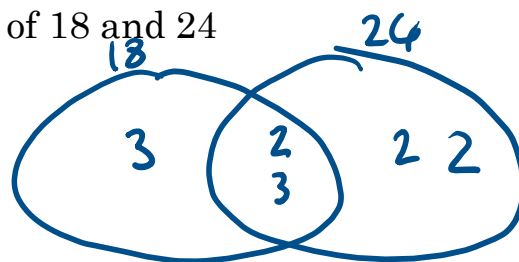
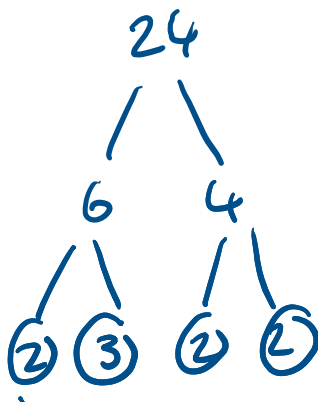
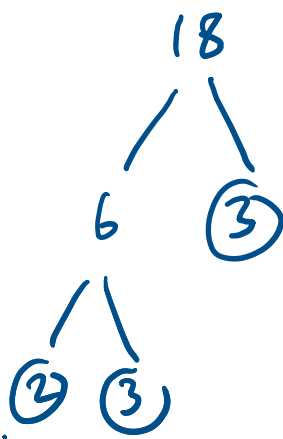
8. Find the lowest common multiple (LCM) of 8 and 15



$$2 \times 2 \times 2 \times 5 \times 3$$

Answer: 120  
(2 marks)

9. Find the lowest common multiple (LCM) of 18 and 24



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

Answer: 72  
(2 marks)

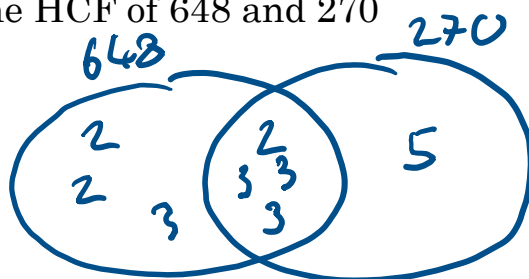


## Using the Prime Factorisation to find the HCF and LCM:

10. You are given that:  $648 = 2^3 \times 3^4$  and  $270 = 2 \times 3^3 \times 5$

Use the information to find:

(i) the HCF of 648 and 270



$$2 \times 3 \times 3 \times 3 = 54$$

Answer: 54  
(2 marks)

(ii) the LCM of 648 and 270

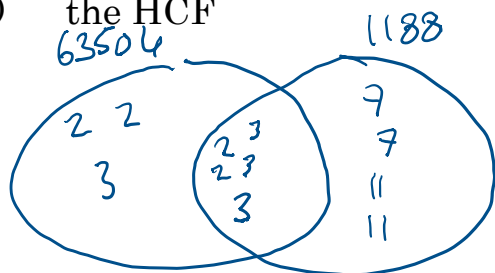
$$2 \times 2 \times 3 \times 2 \times 3 \times 3 \times 3 \times 5 = 3240$$

Answer: 3240  
(2 marks)

11. You are given that:  $63504 = 2^4 \times 3^4 \times 7^2$  and  $1188 = 2^2 \times 3^3 \times 11^2$

Use the information to find:

(i) the HCF



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

Answer: 108  
(2 marks)

(ii) the LCM

$$2 \times 2 \times 3 \times 2 \times 2 \times 3 \times 3 \times 3 \times 7 \times 7 \times 11 \times 11 = 7683984$$

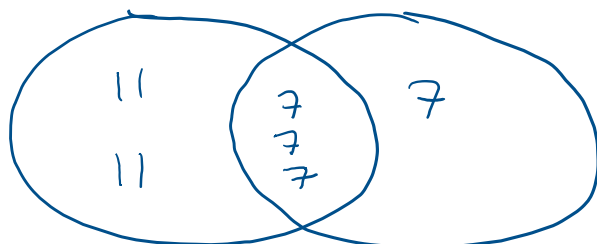
Answer: 7683984  
(2 marks)



12. You are given that:  $A = 2^x \times 7^3 \times 11^2$  and  $B = 2^9 \times 7^4$

The HCF of A and B is 21952.

Use this information to find the value of x.



$$7^3 \times 2^x = 21952$$

$$2^x = \frac{21952}{7^3} = 64$$
$$2^6 = 64$$

Answer:           $x = 6$

(3 marks)

---

13. Three numbers A, B and C have the following prime factorisations:

$$A = 2^7 \times 3^2 \times 5 \times 11^2 \times 13^2$$

$$B = 2^3 \times 5^4 \times 13^2$$

$$C = 2^5 \times 3^2 \times 5^3 \times 13^4$$

(i) Find the HCF of the numbers A, B and C above.

They each share  $2^3 \times 5 \times 13^2 = 6760$

(Easier than Venn diagram)

Answer:           $6760$

(2 marks)



- (ii) Find a number which is a common factor of A, B and C and which is between 50 and 100

Any of  $2^2 \times 13 = 52$   
 $5 \times 13 = 65$

Answer: \_\_\_\_\_  
(2 marks)

### Applied Mixed Practice Problems

14. Tom sells cakes for 30p each at the College Fair, whilst John also sells biscuits for 24p each. Each customer buys either a cake or a biscuit. How many customers will Tom have had, and how many customers will John have had when they taken the same amount of money?

①	30	24
②	60	48
③	90	72
④	120	96
⑤		120

£1.20

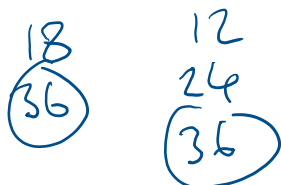
Answer: Tom 4, John 5  
(3 marks)



15.

Aberford trains depart every 18 minutes whilst Dunston trains depart every 12 minutes.

Assuming that both the Aberford and Dunston trains leave the railway station at 08.00am, when is the next time that both trains leave the station at the same time?

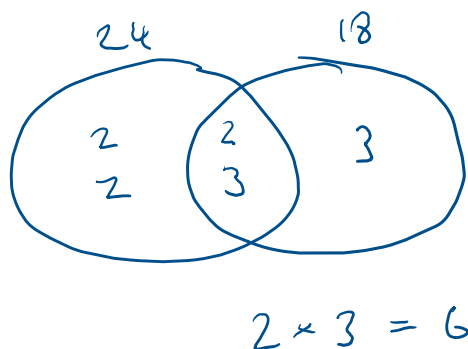
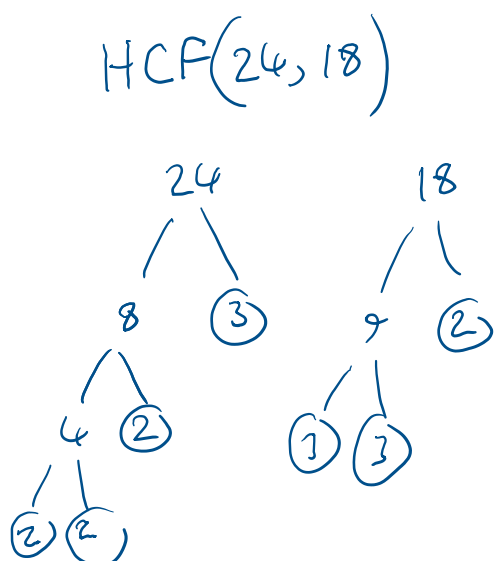


Answer: 08:36 am  
(3 marks)

17. Rachel has 24 red sweets and Maya has 18 green sweets.

They want to arrange the sweets in such a way that each row contains an equal number of sweets and also each row should have only red sweets or green sweets.

What is the greatest number of sweets that can be arranged in each row?

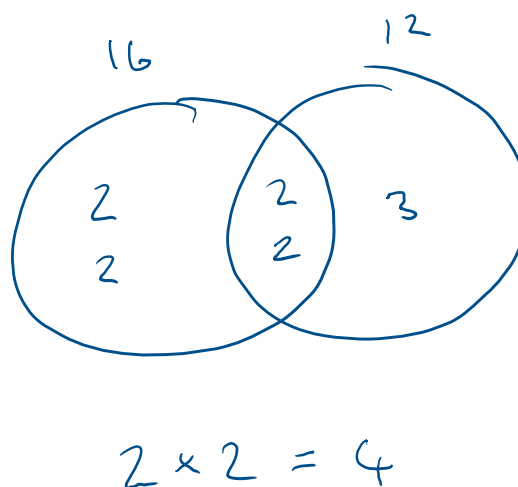
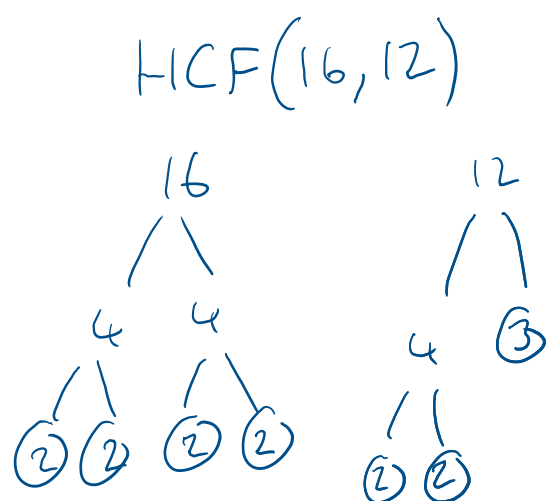


Answer: 6 sweets  
(2 marks)



18. Two metal strips are 16 cm and 12 cm long. Tom wants to use these for building a model. To make the model, he needs pieces of metal all of which are the same length.

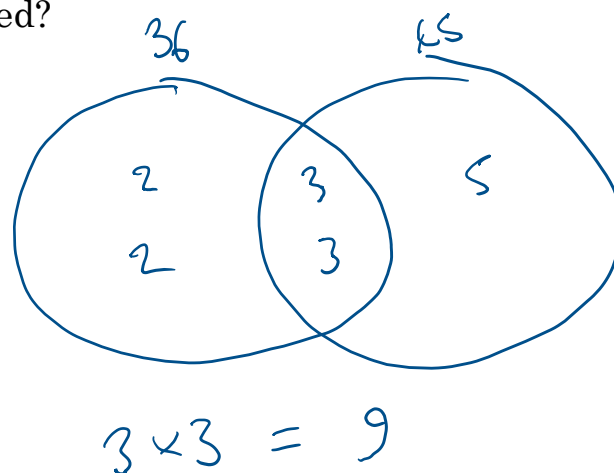
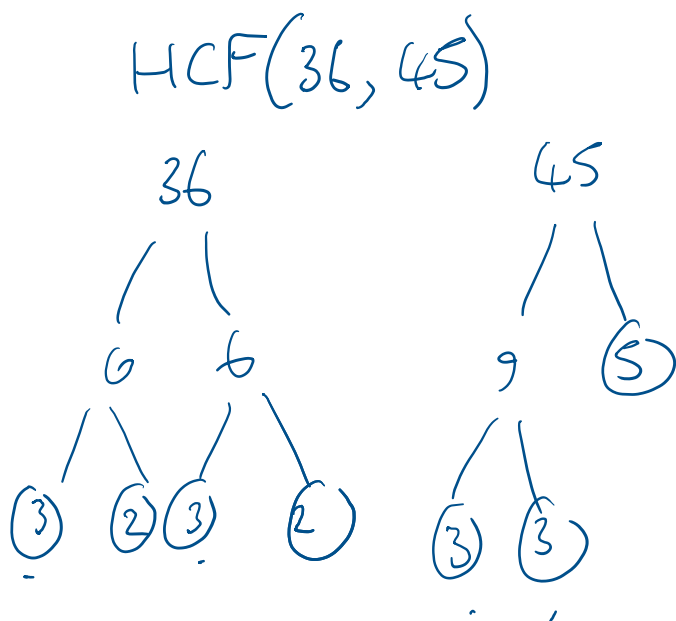
What is the longest he can cut the pieces of metal?



Answer: 4 cm  
(2 marks)

19. For a dinner party, each guest will have a starter made up of carrot sticks and cucumber slices.

There are 36 carrot sticks and 45 cucumber slices available. If each starter is to be identical, with no food left over, what is the greatest number of starters which can be created?

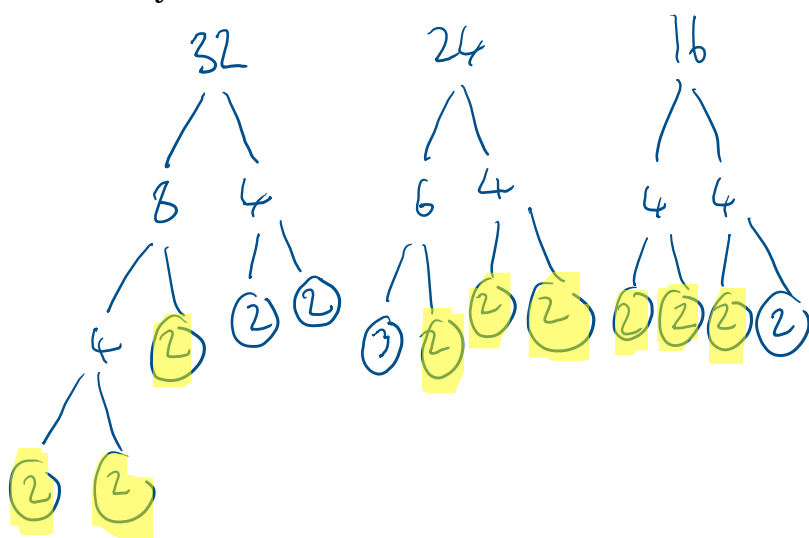


Answer: 9  
(3 marks)





19. Sarah is making identical bunches of balloons for a party. She has 32 purple balloons, 24 white balloons, and 16 red balloons. She wants each bunch to have the same number of each colour. What is the greatest number of bunches that she can make if every balloon is used?



$$\begin{aligned} \text{HCF}(32, 24, 16) \\ = 2 \times 2 \times 2 = 8 \end{aligned}$$

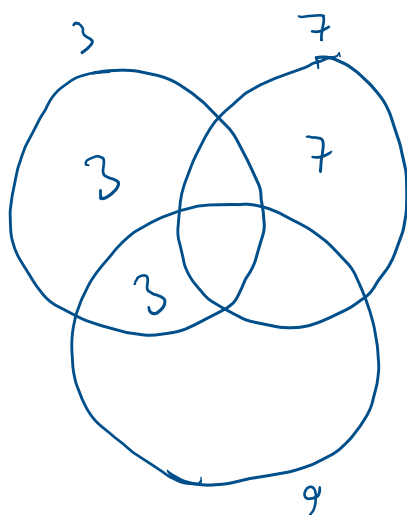
Answer: 8  
(2 marks)

20. At a new clothes shop, every customer gets a gift bag. Each bag can contain up to 3 items, which are shown in the table below:

Item	Frequency
Lipstick	Every 3 <sup>rd</sup> customer
Hand Mirror	Every 7 <sup>th</sup> customer
Bracelet	Every 9 <sup>th</sup> customer

How often will a bag contain all three items?

$$\text{LCM}(3, 7, 9)$$



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

Answer: Every 63 bags  
(3 marks)



21. Burgers come in packages of 8. Bread buns come in packages of 12. How many packages of burgers and bread buns should be purchased to have enough to serve 24 people and have none left over?

$$8 \times 3 = 24$$

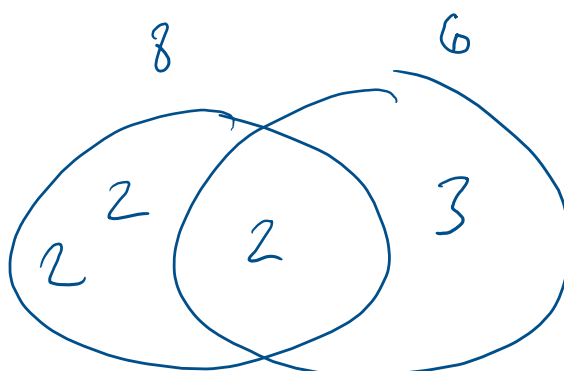
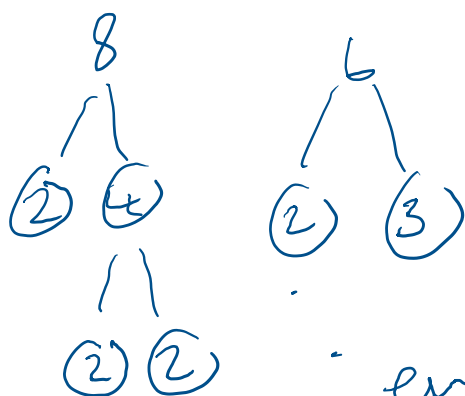
$$12 \times 2 = 24$$

Answer: 3 burger packages  
2 bun packages  
(3 marks)

22. Two flash lights are turned on at the same time. They blink the instant at which they are turned on, then one blinks every 8 seconds and the other blinks every 6 seconds.

In 2 minutes, how many times will they blink at the same time?

LCM(8, 6)



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

∴ every 24 seconds

$$\frac{120 \text{ mins}}{24 \text{ secs}} = 5 \quad 5 + 1 = 6$$

Answer: 6  
(2 marks)

(Because it blinks when switched on too)