Year 7 Core – Prime Numbers and Proof Answers

1.

32	21	30	
4	3	27	37

From the numbers in the box, write down:

- A factor of 16

4

- A multiple of 6

30

- A factor of 63 and multiple of 7

21

- An odd number that is greater than 30

37

2. Match the sequence to its name.

2, 3, 5, 7, …	Square numbers
1, 4, 9, 16, …	Triangular numbers
1, 3, 6, 10, …	Prime numbers

3. Write down a prime number between 40 and 50

41, 43 or 47

4. What is the highest common factor of 16 and 36?

1 mark for correctly listing the factors of 16 and/or 36

4

Explain why $2x$ is a common factor of the three expressions below.

$4x^2$ $8xy$ $6wx$

Shows that $2x$ is a factor

e.g. $4x^2 = 2x \times 2x$
$8xy = 2x \times 4y$
$6wx = 2x \times 3w$

5. Two lights flash together.
The red light then flashes every 8 seconds.
The blue light flashes every 6 seconds.

After how many seconds will the lights flash together again?

1 mark for correctly listing the first 5 multiples of 6 and/or 8

24 seconds

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6.

When you add two prime numbers, the total is always even.

Give an example to show this is false.

Any example that includes 2 as one of the prime numbers e.g. $2 + 5 = 7$

The sum of two consecutive integers is odd.

Give an example to show that this is true.

Many possible solutions e.g. $3 + 4 = 7$

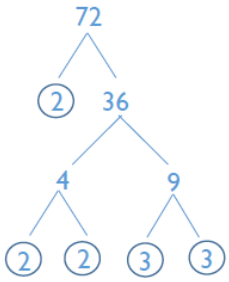
Show that there are exactly 3 square numbers between 20 and 50

$4^2 = 16$
$5^2 = 25$
$6^2 = 36$
$7^2 = 49$
$8^2 = 64$

Exactly 3 square numbers between 20 and 50. The preceding and following square numbers are out of this range.

7.

Express 72 as a product of its prime factors.



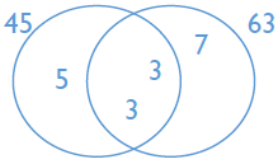
1 mark for correctly breaking 72 down into its prime factors. Allow 1 error.

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

8.

Find the lowest common multiple of 45 and 63

1 mark for breaking 45 and 63 into their prime factors.



1 mark for accurately completing a Venn diagram.
1 mark for correct LCM.

OR

1 mark for correctly writing first five multiples of 45 or 63 (2 marks for both correct).
1 mark for identifying LCM = 315

LCM = 315

9.

Jane has 24 lollies, 60 chews and 96 chocolates. She wants to arrange the sweets into identical packets, without having any sweets left over.

a) What is the maximum number of identical packets Jane can make?

12 *(hcf of 24, 60 and 96)*

b) How many of each type of sweet should Jane put in each packet.

2 lollies, 5 chews and 8 chocolates

Year 7 Higher – Prime Numbers and Proof Answers

1.	72	2.	6 triangular number; 7 prime number; 8 multiple of 4; 9 square number
3.	5, a or $5a$	4.	80 → 10, 8 → 2, 5, 2, 4 → 2, 2 80 = 2×2×2×2×5 (= $2^4 \times 5$)
5.	7 minutes	6.	e.g. 3, 3, 3, 4