HCF/LCM Worksheet

1 **(a)** Write 420 as the product of its prime factors.

.... [2]

(b) Given that $1512 = 2^3 \times 3^3 \times 7$, find the highest common factor of 420 and 1512.

.... [1]

2 **(a)** Write 216 as a product of its prime factors.

.... [2]

(b) Two positive integers are each greater than 25.
Their lowest common multiple (LCM) is 216.
Their highest common factor (HCF) is 18.

Find the two integers.

.... and .... [2]

3 **(a)** Write 108 as the product of its prime factors.

.... [2]

(b) Find the lowest common multiple (LCM) of 108 and 180.

.... [2]

4 (a) Write 168 as a product of its prime factors.

.... [2]

(b) The highest common factor of 168 and N is 42.

Given that $200 < N < 300$, find the two possible values of N.

$N =$ .... and $N =$ .... [2]

5 (a) (i) Write 54 as the product of its prime factors.

Answer .... [1]

(ii) Find the smallest possible integer m such that $54m$ is a cube number.

Answer $m =$ .... [1]

6 **(a)** Express 96 as a product of its prime factors.

Answer .... [1]

(b) 24 is a common factor of 96 and the integer *n*.

Given that *n* is less than 96, find the largest possible value of *n*.

Answer .... [1]

7 **(a)** Express 198 as the product of its prime factors.

Answer .... [1]

(b) $M = 2^2 \times 3 \times 5^2$ $\qquad\qquad$ $N = 2^3 \times 3^2 \times 7$

(i) Find the largest number that divides exactly into *M* and *N*.

Answer .... [1]

(ii) Find the smallest value of *k*, such that $M \times k$ is a cube number.

Answer *k* = ... [1]

8 (a) Express 60 as a product of its prime factors.

Answer .... [1]

(b) Find the smallest possible integer *m* such that 60*m* is a square number.

Answer *m* = ... [1]

(c) The lowest number that is a multiple of both 60 and the integer *n* is 180 .

Find the smallest possible value of *n*.

Answer *n* = ... [1]

9 (a) Express 180 as the product of its prime factors.

Answer ....[1]

(b) $\sqrt{180}$ can be expressed in the form $p\sqrt{q}$, where p and q are integers.

Find the smallest value of $p + q$.

Answer .... [1]

10 (a) Express 108 as a product of its prime factors.

Answer .... [1]

(b) Written as products of their prime factors, $N = 2^p \times 5^q \times 7^r$ and $500 = 2^2 \times 5^3$.

The highest common factor of N and 500 is $2^2 \times 5^2$.
The lowest common multiple of N and 500 is $2^3 \times 5^3 \times 7$.

Find p, q and r.

Answer $p =$ .... , $q =$ .... , $r =$ .... [2]

11 Written as a product of prime factors, $168 = 2^3 \times 3 \times 7$.

(a) Express 140 as a product of its prime factors.

(*a*) .... [1]

(b) Find the highest common factor of 168 and 140.

(*b*) .... [1]

(c) Find the smallest positive integer, n, such that $168n$ is a square number.

(*c*) ....[1]

12 **(a)** Write down all the factors of 18.

(*a*) ....[1]

(b) Write 392 as the product of its prime factors.

(*b*) .... [1]

13 Written as the product of its prime factors, $360 = 2^3 \times 3^2 \times 5$.

(a) Write 108 as the product of its prime factors.

(b) Find the lowest common multiple of 108 and 360.
Give your answer as the product of its prime factors.

(c) Find the smallest positive integer k such that $360k$ is a cube number.

Answer (a) $108 =$ ....[1]

(b) ....[1]

(c) k = ...[1]