

Foundation GCSE: LCM & HCF

Name: _____

Class: _____

Instructions: Answer all questions. Questions are ordered from easiest (1) to hardest (20). Working out should be shown where appropriate.

1. Find the highest common factor (HCF) of 6 and 9.
2. Find the lowest common multiple (LCM) of 4 and 10.
3. Find the HCF of 12 and 15.
4. Find the LCM of 6 and 8.
5. Find the HCF of 20 and 30.
6. Find the LCM of 9 and 12.
7. Find the HCF of 24 and 36.
8. Find the LCM of 15 and 20.
9. Find the HCF of 18, 27, and 45.
10. Find the LCM of 12, 15, and 20.
11. Find the HCF of 56 and 84.
12. Find the LCM of 14 and 18.
13. Two alarm clocks ring together at 07:00. Clock A rings every 12 minutes, and Clock B rings every 15 minutes. At what time will they next ring together?
14. Using prime factor decomposition, find the HCF and LCM of 72 and 108.
15. Find the HCF of 150 and 225.
16. Find the LCM of 45 and 75.
17. Given that $A = 2^3 \times 3^2 \times 5$ and $B = 2^2 \times 3^4$, find the HCF of A and B .
18. Given $A = 2^3 \times 3 \times 5^2$ and $B = 2^2 \times 3^3 \times 7$, find the LCM of A and B in index form.
19. The HCF of two numbers is 6 and their LCM is 120. If one of the numbers is 24, find the other number.
20. Two runners run around a circular track. Runner A takes 48 seconds to complete a lap, and Runner B takes 54 seconds. If they cross the starting line together now, after how many minutes will they next cross the starting line together?

Answers & Worked Solutions

1. 3
Factors of 6 are 1, 2, 3, 6; factors of 9 are 1, 3, 9.
2. 20
Multiples of 4: 4, 8, 12, 16, 20; multiples of 10: 10, 20.
3. 3
Common factors of 12 and 15 peak at 3.
4. 24
Smallest multiple shared by 6 and 8.
5. 10
Largest factor shared by 20 and 30.
6. 36
First shared multiple of 9 and 12.
7. 12
Largest common factor of 24 and 36.
8. 60
Smallest multiple shared by 15 and 20.
9. 9
Factors of 18, 27, 45 share 9 as the highest factor.
10. 60
LCM of 12, 15, 20 is 60.
11. 28
HCF of 56 and 84 is 28.
12. 126
LCM of 14 and 18 is 126.
13. 08:00
LCM of 12 and 15 is 60 minutes (1 hour), so 08:00.
14. HCF = 36, LCM = 216
 $72 = 2^3 \times 3^2$ and $108 = 2^2 \times 3^3$.
15. 75
 $150 = 2 \times 3 \times 5^2$ and $225 = 3^2 \times 5^2$; $HCF = 3 \times 25 = 75$.
16. 225
 $45 = 3^2 \times 5$ and $75 = 3 \times 5^2$; $LCM = 3^2 \times 5^2 = 225$.
17. $2^2 \times 3^2$
Take lowest powers: 2^2 and 3^2 .
18. $2^3 \times 3^3 \times 5^2 \times 7$
Take highest powers of all primes present.
19. 30
Product of two numbers equals Product of HCF and LCM: $a \times b = HCF \times LCM \implies 24 \times b = 6 \times 120 \implies b = 30$.
20. 7.2 minutes (432 seconds)
LCM of 48 and 54 is 432 seconds, which is 7.2 minutes.