

Factors, LCM & GCF

Numbers & Patterns · Grade 6

Score: _____ / 13

★ Hard · 13 Questions

Solve each problem. Show your work in the space provided. Write your answer on the line.

- Find the LCM of 12, 18, and 24.

Answer: _____

- Two buses leave the station together.
Bus A comes every 12 minutes; Bus B every 18 minutes.
When will they next leave together?

Answer: _____

3. Find GCF of 84, 126, and 168.

Answer: _____

4. A number has prime factorisation $2^3 \times 3 \times 5$.
List all its factors.

Answer: _____

5. The LCM of two numbers is 60 and their GCF is 4.
If one number is 12, find the other.

Answer: _____

6. Express 252 as a product of prime factors in index form.

Answer: _____

7. Find the smallest number divisible by both 28 and 42.

Answer: _____

8. Tiles measuring $8\text{ cm} \times 12\text{ cm}$ are used to fill a square floor.
What is the smallest square that can be tiled exactly?

Answer: _____

9. Is $2^2 \times 3 \times 7^2$ prime or composite?

Find its value and the number of factors.

Answer: _____

10. Three bells ring at intervals of 4, 6, and 9 minutes.

They all ring together at noon.

When will they next all ring together?

Answer: _____

11. The GCF of two numbers is 15 and their LCM is 180.

One number is 45. Find the other.

Answer: _____

- 12.** Prove that if $\text{GCF}(a,b) = a$, then a is a factor of b .

Answer: _____

- 13.** Find $\text{LCM}(15, 20, 25)$.

Answer: _____

Answer Key

Factors, LCM & GCF — Hard

1. **72**

$12=2^2 \times 3$. $18=2 \times 3^2$. $24=2^3 \times 3$. $LCM=2^3 \times 3^2=72$.

2. **In 36 minutes (LCM of 12 and 18).**

$LCM(12,18)$: $12=2^2 \times 3$, $18=2 \times 3^2$. $LCM=2^2 \times 3^2=36$ minutes.

3. **42**

$84=2^2 \times 3 \times 7$. $126=2 \times 3^2 \times 7$. $168=2^3 \times 3 \times 7$. $GCF=2 \times 3 \times 7=42$.

4. **1, 2, 3, 4, 5, 6, 8, 10, 12, 15, 20, 24, 30, 40, 60, 120**

Number = $8 \times 3 \times 5=120$. Number of factors = $(3+1)(1+1)(1+1)=16$. List them all.

5. **20**

$GCF \times LCM = \text{product}$. $4 \times 60=240$. Other = $240 \div 12=20$.

6. **$252 = 2^2 \times 3^2 \times 7$**

$252=4 \times 63=4 \times 9 \times 7=2^2 \times 3^2 \times 7$.

7. **84**

$LCM(28,42)$: $28=2^2 \times 7$. $42=2 \times 3 \times 7$. $LCM=2^2 \times 3 \times 7=84$.

8. **$24 \text{ cm} \times 24 \text{ cm}$ (area = 576 cm^2)**

Side of smallest square = $LCM(8,12)=24 \text{ cm}$.

9. **Composite. Value = 588. Number of factors = $(2+1)(1+1)(2+1) = 18$.**

Any number with more than two factors is composite. $2^2 \times 3 \times 7^2=4 \times 3 \times 49=588$. Factors count= $(2+1)(1+1)(2+1)=18$.

10. **12:36 PM (36 minutes later).**

$LCM(4,6,9)$: $4=2^2$, $6=2 \times 3$, $9=3^2$. $LCM=2^2 \times 3^2=36$ minutes.

11. 60

$GCF \times LCM = \text{product}$. $15 \times 180 = 2,700$. Other = $2,700 \div 45 = 60$.

12. If $GCF(a,b)=a$, then a divides both a and b . Since a divides b , a is a factor of b .

$GCF(a,b)=a$ means a is the greatest common factor. Since a is a common factor of a and b , it divides b . So a is a factor of b .

13. 300

$15=3 \times 5$. $20=2^2 \times 5$. $25=5^2$. $LCM=2^2 \times 3 \times 5^2=4 \times 3 \times 25=300$.
