

Number Properties: Primes, Factors & Multiples

Number & Quantity (N) · Subskill 1.1 · Form 1 · Tier 1 — Foundational

Directions: Solve each problem and choose the best answer. A calculator is permitted.

1. Which of the following is the prime factorization of 60?
 - A. $2 \cdot 3 \cdot 5$
 - B. $2^2 \cdot 3 \cdot 5$
 - C. $2^3 \cdot 3 \cdot 5$
 - D. $2^2 \cdot 3^2 \cdot 5$
2. What is the greatest common factor (GCF) of 12 and 18?
 - F. 3
 - G. 6
 - H. 12
 - J. 36
3. What is the least common multiple (LCM) of 4 and 6?
 - A. 2
 - B. 10
 - C. 12
 - D. 24
4. Which of the following numbers is prime?
 - F. 23
 - G. 25
 - H. 27
 - J. 33
5. What is the smallest positive integer that is divisible by both 6 and 9?
 - A. 3
 - B. 15
 - C. 18
 - D. 54
6. How many positive factors does 12 have?
 - F. 4
 - G. 5
 - H. 6
 - J. 12
7. Which of the following is the prime factorization of 90?
 - A. $2 \cdot 3^2 \cdot 5$
 - B. $2^2 \cdot 3^2 \cdot 5$
 - C. $2 \cdot 3^3 \cdot 5$
 - D. $2^2 \cdot 3^3 \cdot 5$
8. What is the greatest common factor (GCF) of 20 and 30?
 - F. 2
 - G. 5
 - H. 10
 - J. 60
9. What is the least common multiple (LCM) of 3 and 9?
 - A. 3
 - B. 9
 - C. 12
 - D. 27
10. How many prime numbers are there between 20 and 30?
 - F. 1
 - G. 2
 - H. 3
 - J. 4
11. What is the smallest positive integer that is divisible by both 4 and 10?
 - A. 2
 - B. 4
 - C. 10
 - D. 20
12. How many positive factors does 18 have?
 - F. 2
 - G. 3
 - H. 5
 - J. 6

SolutionsNumber Properties: Primes, Factors & Multiples · Number & Quantity (N) · Subskill 1.1 · Form 1 · Tier 1

- 1. B** Divide out primes: $60 = 2 \cdot 30 = 2 \cdot 2 \cdot 15 = 2^2 \cdot 3 \cdot 5$.
- 2. G** $12 = 2^2 \cdot 3$ and $18 = 2 \cdot 3^2$; shared factors give $2 \cdot 3 = 6$.
- 3. C** Multiples of 6: 6, 12, ...; multiples of 4: 4, 8, 12, ... The least shared is 12.
- 4. F** 23 has no factors but 1 and itself. ($25 = 5^2$, $27 = 3^3$, $33 = 3 \cdot 11$.)
- 5. C** LCM(6, 9): $6 = 2 \cdot 3$, $9 = 3^2$, so $\text{LCM} = 2 \cdot 3^2 = 18$.
- 6. H** Factors of 12: 1, 2, 3, 4, 6, 12 — that is 6 factors.
- 7. A** $90 = 2 \cdot 45 = 2 \cdot 3 \cdot 15 = 2 \cdot 3^2 \cdot 5$.
- 8. H** $20 = 2^2 \cdot 5$ and $30 = 2 \cdot 3 \cdot 5$; shared factors give $2 \cdot 5 = 10$.
- 9. B** 9 is itself a multiple of 3, so $\text{LCM}(3, 9) = 9$.
- 10. G** Between 20 and 30 the primes are 23 and 29 — that is 2 primes.
- 11. D** LCM(4, 10): $4 = 2^2$, $10 = 2 \cdot 5$, so $\text{LCM} = 2^2 \cdot 5 = 20$.
- 12. J** Factors of 18: 1, 2, 3, 6, 9, 18 — that is 6 factors.

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