

For two or more nonzero whole numbers, a **common factor** is a whole number that is a factor of each number. The **greatest common factor (GCF)** of two or more nonzero whole numbers is the greatest of their common factors.

EXAMPLE Find the greatest common factor of 30 and 42.

Write the prime factorization of each number. The greatest common factor is the product of the common prime factors.

$$30 = 2 \cdot 3 \cdot 5 \quad \text{and} \quad 42 = 2 \cdot 3 \cdot 7$$

The common prime factors are 2 and 3. The GCF is the product $2 \cdot 3 = 6$.

▶ The greatest common factor of 30 and 42 is 6.

A **multiple** of a whole number is the product of the number and any nonzero whole number. A **common multiple** of two or more whole numbers is a multiple of each number. The **least common multiple (LCM)** of two or more whole numbers is the least of their common multiples.

EXAMPLE Find the least common multiple of 10 and 15.

Write the prime factorization of each number. The least common multiple is the product of the factors, using each common prime factor only once.

$$10 = 2 \cdot 5 \quad \text{and} \quad 15 = 3 \cdot 5$$

The common prime factor is 5. The LCM is the product $2 \cdot 3 \cdot 5 = 30$.

▶ The least common multiple of 10 and 15 is 30.

PRACTICE

Write the prime factorization of the number if it is not a prime number. If the number is prime, write *prime*.

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|--------|--------|--------|--------|
| 1. 28 | 2. 16 | 3. 11 | 4. 100 |
| 5. 81 | 6. 49 | 7. 60 | 8. 53 |
| 9. 180 | 10. 19 | 11. 51 | 12. 72 |

Find the greatest common factor of the pair of numbers.

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| 13. 4, 8 | 14. 5, 6 | 15. 60, 18 | 16. 2, 10 |
| 17. 36, 27 | 18. 15, 21 | 19. 12, 16 | 20. 24, 108 |
| 21. 48, 88 | 22. 8, 12 | 23. 20, 28 | 24. 3, 5 |

Find the least common multiple of the pair of numbers.

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| 25. 6, 9 | 26. 3, 8 | 27. 5, 45 | 28. 16, 20 |
| 29. 10, 65 | 30. 12, 15 | 31. 9, 30 | 32. 8, 9 |
| 33. 2, 14 | 34. 28, 32 | 35. 7, 49 | 36. 4, 6 |