Finding Factors and Multiples

Name: _____	Date: _____	Score: _____ / 24

Quick Review

A **factor** of a number divides it evenly, with no remainder. To list all the factors of a number, look for pairs that multiply to give it — for 12, the pairs are 1×12, 2×6, and 3×4. A **multiple** of a number is what you get when you skip-count by it, like $4, 8, 12, 16, \ldots$ for the number 4. Every number is a **factor** of its own multiples. Knowing factors and multiples helps you with division, fractions, and finding patterns in numbers.

◇ **Example:** List all the factors of 24.

⇒ Look for every pair of numbers that multiplies to 24. Start at 1: $1 \times 24 = 24$. Then $2 \times 12 = 24$. Then $3 \times 8 = 24$. Then $4 \times 6 = 24$. Does 5 work? No, 24 is not divisible by 5. Next would be 6×4, but we already have that pair, so we can stop. Collecting every number we found gives the full list of factors.

Answer: $1, 2, 3, 4, 6, 8, 12, 24$

PRACTICE

Find the factors or multiples as each problem asks.

1. List all the factors of 12 _____
2. List all the factors of 16 _____
3. List all the factors of 18 _____
4. List all the factors of 20 _____
5. List all the factors of 28 _____
6. List all the factors of 30 _____
7. List all the factors of 36 _____
8. List all the factors of 40 _____
9. List all the factors of 42 _____
10. List all the factors of 45 _____
11. List all the factors of 48 _____
12. List all the factors of 54 _____
13. List the first five multiples of 4 _____
14. List the first five multiples of 6 _____
15. List the first five multiples of 7 _____
16. List the first five multiples of 8 _____
17. List the first five multiples of 9 _____
18. List the first five multiples of 10 _____
19. List the first four multiples of 12 _____
20. Is 6 a factor of 48? _____

Word Problems

21. Mr. Lee wants to arrange 24 desks into equal rows. What are all the different numbers of rows he could make? _____
22. A baker sells cookies in packs of 6. List the first five amounts of cookies she could sell. _____
23. Sara is making party bags. She has 36 stickers and wants every bag to have the same number with none left over. What are all the bag sizes that work? _____
24. A clock chimes every 8 minutes. If it chimes at minute 8, list the next four times it chimes. _____

Answer Keys

1. $1, 2, 3, 4, 6, 12$
2. $1, 2, 4, 8, 16$
3. $1, 2, 3, 6, 9, 18$
4. $1, 2, 4, 5, 10, 20$
5. $1, 2, 4, 7, 14, 28$
6. $1, 2, 3, 5, 6, 10, 15, 30$
7. $1, 2, 3, 4, 6, 9, 12, 18, 36$
8. $1, 2, 4, 5, 8, 10, 20, 40$
9. $1, 2, 3, 6, 7, 14, 21, 42$
10. $1, 3, 5, 9, 15, 45$
11. $1, 2, 3, 4, 6, 8, 12, 16, 24, 48$
12. $1, 2, 3, 6, 9, 18, 27, 54$
13. $4, 8, 12, 16, 20$
14. $6, 12, 18, 24, 30$
15. $7, 14, 21, 28, 35$
16. $8, 16, 24, 32, 40$
17. $9, 18, 27, 36, 45$
18. $10, 20, 30, 40, 50$
19. $12, 24, 36, 48$
20. Yes
21. $1, 2, 3, 4, 6, 8, 12,$ or 24 rows
22. $6, 12, 18, 24, 30$ cookies
23. $1, 2, 3, 4, 6, 9, 12, 18,$ or 36
24. $16, 24, 32, 40$ minutes

Step-by-Step Explanations

1. The factor pairs are 1×12, 2×6, and 3×4.
2. The factor pairs are 1×16, 2×8, and 4×4.
3. The factor pairs are 1×18, 2×9, and 3×6.
4. The factor pairs are 1×20, 2×10, and 4×5.
5. The factor pairs are 1×28, 2×14, and 4×7.
6. The factor pairs are 1×30, 2×15, 3×10, and 5×6.
7. The factor pairs are 1×36, 2×18, 3×12, 4×9, and 6×6.
8. The factor pairs are 1×40, 2×20, 4×10, and 5×8.
9. The factor pairs are 1×42, 2×21, 3×14, and 6×7.
10. The factor pairs are 1×45, 3×15, and 5×9.
11. The factor pairs are 1×48, 2×24, 3×16, 4×12, and 6×8.
12. The factor pairs are 1×54, 2×27, 3×18, and 6×9.
13. Skip-count by 4: $4, 8, 12, 16, 20$.
14. Skip-count by 6: $6, 12, 18, 24, 30$.
15. Skip-count by 7: $7, 14, 21, 28, 35$.
16. Skip-count by 8: $8, 16, 24, 32, 40$.
17. Skip-count by 9: $9, 18, 27, 36, 45$.
18. Skip-count by 10: $10, 20, 30, 40, 50$.
19. Skip-count by 12: $12, 24, 36, 48$.
20. $48 \div 6 = 8$ with no remainder, so 6 is a factor of 48.
21. The number of rows must be a factor of 24. The factors of 24 are $1, 2, 3, 4, 6, 8, 12,$ and 24.
22. The amounts are multiples of 6: $6, 12, 18, 24,$ and 30.
23. Each bag size must be a factor of 36: $1, 2, 3, 4, 6, 9, 12, 18,$ and 36.
24. The chime times are multiples of 8: after 8 come $16, 24, 32,$ and 40.

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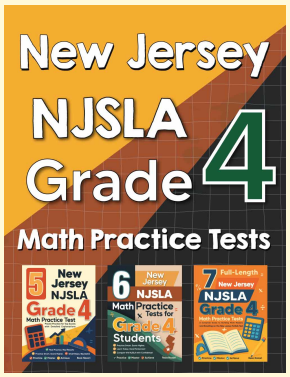

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