

# Finding Factors and Multiples

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Score: \_\_\_\_\_ / 24

## Q 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  $1 \times 12$ ,  $2 \times 6$ , and  $3 \times 4$ . A **multiple** of a number is what you get when you skip-count by it, like 4, 8, 12, 16, . . . 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  $6 \times 4$ , 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  | _____ | 11. List all the factors of 48          | _____ |
| 2. List all the factors of 16  | _____ | 12. List all the factors of 54          | _____ |
| 3. List all the factors of 18  | _____ | 13. List the first five multiples of 4  | _____ |
| 4. List all the factors of 20  | _____ | 14. List the first five multiples of 6  | _____ |
| 5. List all the factors of 28  | _____ | 15. List the first five multiples of 7  | _____ |
| 6. List all the factors of 30  | _____ | 16. List the first five multiples of 8  | _____ |
| 7. List all the factors of 36  | _____ | 17. List the first five multiples of 9  | _____ |
| 8. List all the factors of 40  | _____ | 18. List the first five multiples of 10 | _____ |
| 9. List all the factors of 42  | _____ | 19. List the first four multiples of 12 | _____ |
| 10. List all the factors of 45 | _____ | 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

- |  |  |
|--|--|
| <p>1. 1, 2, 3, 4, 6, 12</p> <p>2. 1, 2, 4, 8, 16</p> <p>3. 1, 2, 3, 6, 9, 18</p> <p>4. 1, 2, 4, 5, 10, 20</p> <p>5. 1, 2, 4, 7, 14, 28</p> <p>6. 1, 2, 3, 5, 6, 10, 15, 30</p> <p>7. 1, 2, 3, 4, 6, 9, 12, 18, 36</p> <p>8. 1, 2, 4, 5, 8, 10, 20, 40</p> <p>9. 1, 2, 3, 6, 7, 14, 21, 42</p> <p>10. 1, 3, 5, 9, 15, 45</p> <p>11. 1, 2, 3, 4, 6, 8, 12, 16, 24, 48</p> <p>12. 1, 2, 3, 6, 9, 18, 27, 54</p> | <p>13. 4, 8, 12, 16, 20</p> <p>14. 6, 12, 18, 24, 30</p> <p>15. 7, 14, 21, 28, 35</p> <p>16. 8, 16, 24, 32, 40</p> <p>17. 9, 18, 27, 36, 45</p> <p>18. 10, 20, 30, 40, 50</p> <p>19. 12, 24, 36, 48</p> <p>20. Yes</p> <p>21. 1, 2, 3, 4, 6, 8, 12, or 24 rows</p> <p>22. 6, 12, 18, 24, 30 cookies</p> <p>23. 1, 2, 3, 4, 6, 9, 12, 18, or 36</p> <p>24. 16, 24, 32, 40 minutes</p> |
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### Step-by-Step Explanations

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