Factors, Multiples, Prime, and Composite Numbers

Explore ideas and representations

Name _____ **Date** _____ **Score** _____ / 8

QUICK REVIEW

Factors multiply to a number: 1×12, 2×6, and 3×4 are the factor pairs of 12. Multiples of 4 include $4, 8, 12$. A prime has exactly two factors; 7 has $1, 7$. 12 is composite; 1 is neither prime nor composite.

Worked example

Find all factor pairs of 18.

1. $1 \times 18 = 18$, $2 \times 9 = 18$, $3 \times 6 = 18$.

2. All factors are $1, 2, 3, 6, 9, 18$.

3. The largest smaller partner needed is 4; larger first partners repeat a pair.

Answer: Pairs: $(1, 18)$, $(2, 9)$, $(3, 6)$.

Practice Problems

Show your thinking.

1. List every factor pair of 24.

2. Is 13 prime or composite? Use its factors.

3. Write the first five positive multiples of 6.

4. A student says 4 is a multiple of 20. Correct the words.

5. Arrange 16 tiles in all possible rectangular row-by-column sizes.

6. Find all numbers less than 25 that are positive multiples of both 3 and 4.

7. Explain why 1 is not prime.

8. Can 28 students make equal teams of 4 with nobody left? Find the team count.

Answer Key

1. Pairs: $(1, 24)$, $(2, 12)$, $(3, 8)$, $(4, 6)$.
2. Prime.
3. $6, 12, 18, 24, 30$.
4. 4 is a factor of 20; 20 is a multiple of 4.
5. Pairs: $(1, 16)$, $(2, 8)$, $(4, 4)$.
6. $12, 24$.
7. Neither.
8. Yes; 7 teams.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. $1 \times 24 = 24$, $2 \times 12 = 24$, $3 \times 8 = 24$, $4 \times 6 = 24$.
2. All factors are $1, 2, 3, 4, 6, 8, 12, 24$.
3. The largest smaller partner needed is 4; larger first partners repeat a pair.

Problem 2

1. The positive factors are $1, 13$.
2. There are 2 factors.
3. Exactly 2 factors means 13 is prime.

Problem 3

1. $6 \times 1 = 6$ and $6 \times 2 = 12$.
2. $6 \times 3 = 18$ and $6 \times 4 = 24$.
3. $6 \times 5 = 30$; each new term adds 6.

Problem 4

1. $4 \times 5 = 20$.
2. $20 \div 4 = 5$ is a whole number.
3. Thus 4 divides 20; it is the factor, not the larger multiple.

Problem 5

1. $1 \times 16 = 16$, $2 \times 8 = 16$, $4 \times 4 = 16$.
2. All factors are $1, 2, 4, 8, 16$.
3. The largest smaller partner needed is 4; larger first partners repeat a pair.

Problem 6

1. Multiples of 4 below 25 are $4, 8, 12, 16, 20, 24$.
2. Of these, $12 \div 3 = 4$ and $24 \div 3 = 8$ are whole numbers.
3. The other four leave remainders when divided by 3.

Problem 7

1. The positive factors are 1.
2. There are 1 factors.
3. 1 has only one factor, so it is neither.

Problem 8

1. $28 \div 4 = 7$ with remainder 0.
2. $4 \times 7 = 28$ checks the total.
3. Therefore 4 is a factor of 28 and the teams work.

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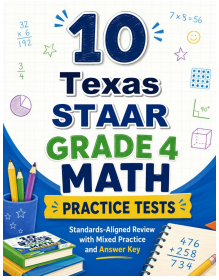

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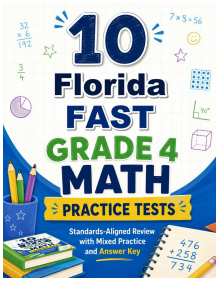

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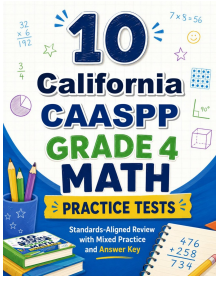

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