Factors, Multiples, Prime, and Composite Numbers

Spot mistakes, reason, and work backward

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. Test whether 29 has exactly two factors.

2. Correct: 21 is prime because it is odd.

3. Find a square factor pair and all the other factor pairs of 36.

4. Find a composite number between 14 and 18 that is a multiple of 5.

5. Complete the multiples list $7, 14, \square, 28, \square$.

6. Is every factor of 18 also a factor of 36? Check the list.

7. Find all equal-row choices for arranging 30 seedlings.

8. Explain why 2 is the only even prime.

Answer Key

1. Prime.
2. 21 is composite.
3. Pairs: $(1, 36)$, $(2, 18)$, $(3, 12)$, $(4, 9)$, $(6, 6)$.
4. 15.
5. $21, 35$.
6. Yes.
7. Pairs: $(1, 30)$, $(2, 15)$, $(3, 10)$, $(5, 6)$.
8. Prime.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. The positive factors are $1, 29$.
2. There are 2 factors.
3. Exactly 2 factors means 29 is prime.

Problem 2

1. $3 \times 7 = 21$ gives two factors besides 1 and 21.
2. The full factor list is $1, 3, 7, 21$.
3. Four factors, not two, make 21 composite.

Problem 3

1. $1 \times 36 = 36$, $2 \times 18 = 36$, $3 \times 12 = 36$, $4 \times 9 = 36$, $6 \times 6 = 36$.
2. All factors are $1, 2, 3, 4, 6, 9, 12, 18, 36$.
3. The largest smaller partner needed is 6; larger first partners repeat a pair.

Problem 4

1. The whole numbers strictly inside are $15, 16, 17$.
2. $15 = 5 \times 3$ is the only multiple of 5.
3. The factors $1, 3, 5, 15$ show it is composite.

Problem 5

1. The increase from 7 to 14 is 7.
2. $14 + 7 = 21$ and $21 + 7 = 28$.
3. $28 + 7 = 35$ completes the list.

Problem 6

1. The factors of 18 are $1, 2, 3, 6, 9, 18$.
2. $36 \div 1 = 36$, $36 \div 2 = 18$, $36 \div 3 = 12$.
3. $36 \div 6 = 6$, $36 \div 9 = 4$, $36 \div 18 = 2$; all are whole.

Problem 7

1. $1 \times 30 = 30$, $2 \times 15 = 30$, $3 \times 10 = 30$, $5 \times 6 = 30$.
2. All factors are $1, 2, 3, 5, 6, 10, 15, 30$.
3. The largest smaller partner needed is 5; larger first partners repeat a pair.

Problem 8

1. The positive factors are $1, 2$.
2. There are 2 factors.
3. Exactly 2 factors make 2 prime; any larger even number also has factor 2 besides 1 and itself.

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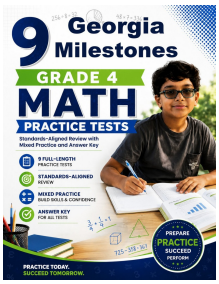

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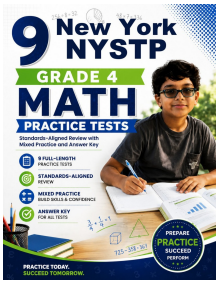

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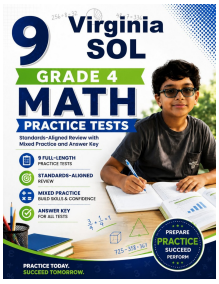

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