Multi-Digit Multiplication

Spot mistakes, reason, and work backward

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

QUICK REVIEW

Break a factor into place-value parts. $23 \times 14 = 23 \times 10 + 23 \times 4 = 230 + 92 = 322$. For 302×6, include the zero tens: $300 \times 6 + 2 \times 6 = 1{,}812$.

Worked example

Use partial products to find 46×23.

1. $23 = 20 + 3$.
2. $46 \times 20 = 920$ and $46 \times 3 = 138$.
3. $920 + 138 = 1058$; check $1058 \div 23 = 46$.
Answer: 1058.

Practice Problems

Show your thinking.

1. For 73×26, the ones partial product is 438. Find the tens partial product and full total.

Factor part	Partial product
20	☐
6	438

2. Find the one-digit factor in $405 \times \square = 2{,}835$ using equal groups.

3. An area model gives $36 \times 40 = 1{,}440$ and $36 \times 8 = 288$. What factor was split? Find the full product.

4. A student writes $1{,}206 \times 5 = 603$. Locate the missing place-value factor and repair the product.

5. A student adds $52 \times 30 = 156$ and $52 \times 4 = 208$ to get 364. Fix the tens partial product.

6. A rectangle has area 864 square units and one side 24. Find the other side.

7. Explain why 19×45 is 45 less than 20×45. Find both products.

8. A packing diagram has 81 in each of 17 rows. Use tens and ones rows to find the total.

Rows	Items per row
10	81
7	81

Answer Key

1. Tens part $1{,}460$; total $1{,}898$.
2. 7.
3. Factor 48; product $1{,}728$.
4. $6{,}030$.
5. $1{,}768$.
6. 36.
7. 855 and 900.
8. 1377.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. The 2 in 26 means 20, so $73 \times 20 = 1{,}460$.
2. The ones part is $73 \times 6 = 438$.
3. $1{,}460 + 438 = 1{,}898$ combines the two partial products.

Problem 2

1. Five groups give $405 \times 5 = 2{,}025$.
2. The remaining $2{,}835 - 2{,}025 = 810$ is 2 more groups of 405.
3. The factor is $5 + 2 = 7$; $405 \times 7 = 2{,}835$.

Problem 3

1. The two pieces of the split factor are 40 and 8.
2. $40 + 8 = 48$, so the model represents 36×48.
3. $1{,}440 + 288 = 1{,}728$ is the full product.

Problem 4

1. $1{,}200 \times 5 = 6{,}000$.
2. $6 \times 5 = 30$.
3. $6{,}000 + 30 = 6{,}030$; 603 is ten times too small.

Problem 5

1. $52 \times 30 = 1{,}560$, not 156.
2. $52 \times 4 = 208$.
3. $1{,}560 + 208 = 1{,}768$.

Problem 6

1. $24 \times 30 = 720$.
2. $864 - 720 = 144 = 24 \times 6$.
3. The side is $30 + 6 = 36$; $24 \times 36 = 864$.

Problem 7

1. $20 \times 45 = 900$.
2. One fewer group removes 45: $900 - 45 = 855$.
3. Thus $19 \times 45 = 855$ and the difference is 45.

Problem 8

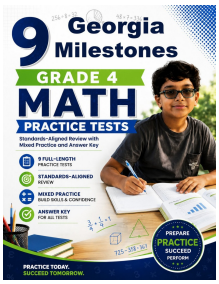
1. $17 = 10 + 7$.
2. $81 \times 10 = 810$ and $81 \times 7 = 567$.
3. $810 + 567 = 1377$; check $1377 \div 17 = 81$.

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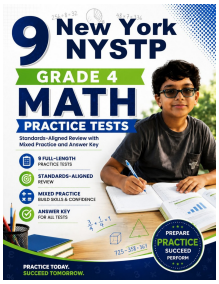
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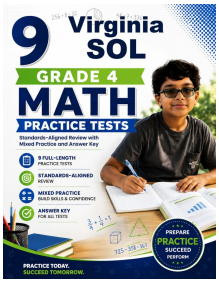
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