Dividing with Two-Digit Divisors

Dividing with Two-Digit Divisors: Apply, Compare, and Design

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QUICK REVIEW

Estimate a quotient, subtract groups, then check. In $437 \div 18$, $18 \times 20 = 360$, leaving 77; $18 \times 4 = 72$, leaving 5. Thus 24 remainder 5, and $18 \times 24 + 5 = 437$. A remainder is less than the divisor.

Worked example

Divide $619 \div 22$. Give quotient and remainder.

1. Take 20 groups: $22 \times 20 = 440$; $619 - 440 = 179$.
2. Take 8 more groups: $22 \times 8 = 176$; $179 - 176 = 3$.
3. Quotient $20 + 8 = 28$; check $22 \times 28 + 3 = 619$ and $3 < 22$.
Answer: 28 remainder 3.

Practice Problems

Show your thinking.

1. A van seats 24 people. How many vans are needed for 651 people?

2. A supply has 486 sheets. Each class needs 16. Can 31 full classes receive sheets? How many additional sheets would be needed?

3. A shipment has 33 full trays of 35 items and 9 extra items. Find the shipment size.

4. Pack 1020 beads into full bags of 28. How many full bags and leftover beads?

5. Share 1653 whole counters among 42 students without breaking counters. State each share and the unused count.

6. A van seats 18 people. How many vans are needed for 756 people?

7. A supply has 1461 sheets. Each class needs 32. Can 46 full classes receive sheets? How many additional sheets would be needed?

8. A shipment has 48 full trays of 25 items and 24 extra items. Find the shipment size.

Answer Key

1. 28 vans.
2. No; 10 additional sheets.
3. 1164.
4. 36 remainder 12.
5. 39 remainder 15.
6. 42 vans.
7. No; 11 additional sheets.
8. 1224.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. Take 20 groups: $24 \times 20 = 480$; $651 - 480 = 171$.
2. Take 7 more groups: $24 \times 7 = 168$; $171 - 168 = 3$.
3. Quotient $20 + 7 = 27$; check $24 \times 27 + 3 = 651$ and $3 < 24$.
4. One extra van is needed for the remaining 3 people; total 28 vans.

Problem 2

1. Take 30 groups: $16 \times 30 = 480$; $486 - 480 = 6$.
2. Take 0 more groups: $16 \times 0 = 0$; $6 - 0 = 6$.
3. Quotient $30 + 0 = 30$; check $16 \times 30 + 6 = 486$ and $6 < 16$.
4. $16 \times 31 = 496$; $496 - 486 = 10$ sheets short.

Problem 3

1. Full groups contain $35 \times 33 = 1155$ items.
2. Add the leftovers: $1155 + 9 = 1164$ items.
3. Check the valid remainder: $9 < 35$; grouping the total returns 33 full groups.

Problem 4

1. Take 30 groups: $28 \times 30 = 840$; $1020 - 840 = 180$.
2. Take 6 more groups: $28 \times 6 = 168$; $180 - 168 = 12$.
3. Quotient $30 + 6 = 36$; check $28 \times 36 + 12 = 1020$ and $12 < 28$.

Problem 5

1. Take 30 groups: $42 \times 30 = 1260$; $1653 - 1260 = 393$.
2. Take 9 more groups: $42 \times 9 = 378$; $393 - 378 = 15$.
3. Quotient $30 + 9 = 39$; check $42 \times 39 + 15 = 1653$ and $15 < 42$.

Problem 6

1. Take 40 groups: $18 \times 40 = 720$; $756 - 720 = 36$.
2. Take 2 more groups: $18 \times 2 = 36$; $36 - 36 = 0$.
3. Quotient $40 + 2 = 42$; check $18 \times 42 + 0 = 756$ and $0 < 18$.
4. There are no remaining 0 people; total 42 vans.

Problem 7

1. Take 40 groups: $32 \times 40 = 1280$; $1461 - 1280 = 181$.
2. Take 5 more groups: $32 \times 5 = 160$; $181 - 160 = 21$.
3. Quotient $40 + 5 = 45$; check $32 \times 45 + 21 = 1461$ and $21 < 32$.
4. $32 \times 46 = 1472$; $1472 - 1461 = 11$ sheets short.

Problem 8

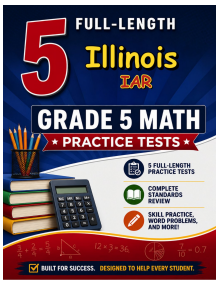
1. Full groups contain $25 \times 48 = 1200$ items.
2. Add the leftovers: $1200 + 24 = 1224$ items.
3. Check the valid remainder: $24 < 25$; grouping the total returns 48 full groups.

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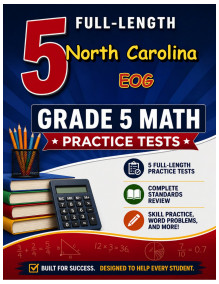
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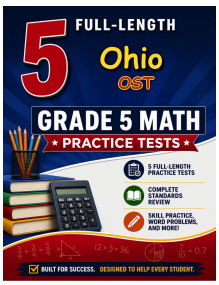
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