Diagram 5b: Analyzing Multiple Intersections (Part 2: Solution)

STEP 2: Cross-Check All Constraints Together

Now use logic: if one cell is a certain digit, what does that force in other cells?

💡 Let's Reason Through Column 2 (Yellow):

The DOWN 7 run has only **3 possible combinations:** 1+6, 2+5, 3+4

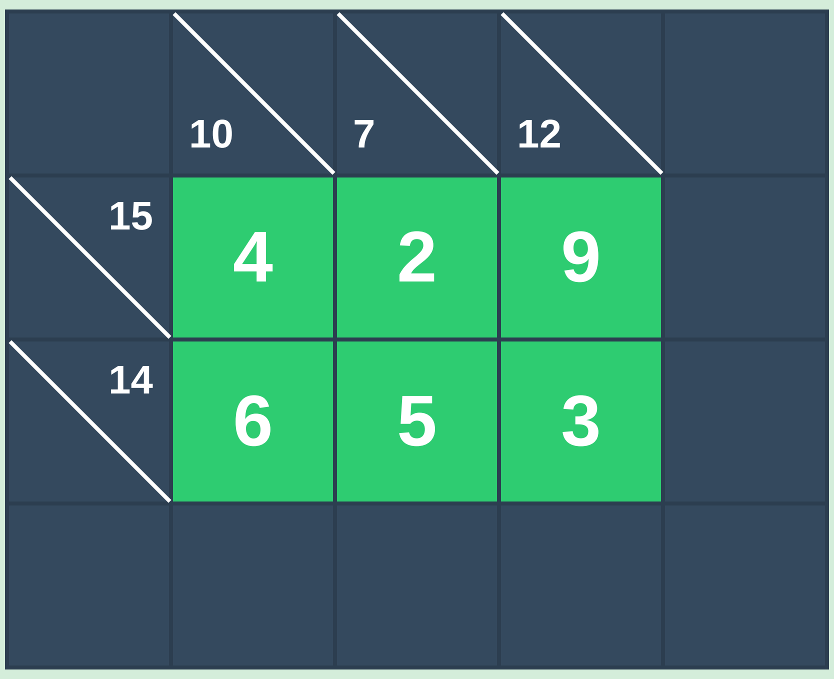
Try 1+6: Top=1, Bottom=6
- ACROSS 15 would have 1 in middle position
- But look at ACROSS 15 combinations: 1+5+9, 1+6+8, 2+4+9, 2+5+8, 2+6+7, 3+4+8, 3+5+7, 4+5+6
- If middle cell = 1, there's NO valid combination! ❌

Try 3+4: Top=3, Bottom=4
- ACROSS 14 would have 4 in middle position
- Check ACROSS 14 combinations: 1+4+9, 1+5+8, 1+6+7, 2+3+9, 2+4+8, 2+5+7, 3+4+7, 3+5+6
- If middle cell = 4, possible combinations: 1+4+9, 2+4+8, 3+4+7
- But Column 1 needs 10 and Column 3 needs 12...
- After checking: this creates conflicts! ❌

Try 2+5: Top=2, Bottom=5 ✓
- This is the only option that works with all other constraints!
- With Top=2 in ACROSS 15, we can use 2+4+9 (Column 1=4, Column 3=9)
- Then DOWN 10 forces Bottom of Column 1 = 6
- And DOWN 12 forces Bottom of Column 3 = 3
- Check ACROSS 14: 6+5+3 = 14 ✓ Perfect!

STEP 3: The Solution!

✅ By analyzing all intersections together, we found the unique solution



✓ Complete Verification:

ACROSS Runs:
- Row 1: 4 + 2 + 9 = 15 ✓
- Row 2: 6 + 5 + 3 = 14 ✓

DOWN Runs:
- Col 1: 4 + 6 = 10 ✓
- Col 2: 2 + 5 = 7 ✓
- Col 3: 9 + 3 = 12 ✓

No repeated digits in any run ✓ | All sums correct ✓

🎯 **Why This Technique Matters:** Instead of trying combinations randomly, we used the intersection constraints to systematically eliminate impossible options. By focusing on the most constrained run (DOWN 7 with only 3 possibilities), we quickly found the solution. This "constraint propagation" technique is essential for harder puzzles where individual runs have many possibilities, but their intersections drastically limit the options.