

Problems for the Web

P4W7: Wrong Numbers

Curriculum Areas: Problem Solving, Number Sense, Computation, Use of a Calculator

Introduction:

These activities are intended for use with a calculator. These can be used effectively when students work in pairs with one calculator between the two of them.

In each problem, students should derive a solution using estimation skills and/or mental computation, and then check using a calculator.

Discuss with students the different strategies they used. (See notes under "P4W7(a)" for examples of strategies that might be used).

Watch for P4W9: More Wrong Numbers

For the Teacher:

P4W7 (a): Extra Numbers

After students have had time to work on these problems, you may wish to discuss with them the strategies they used. Various strategies that could be used are

- trial and error (or, more accurately, trial and adjustment)
- working backwards (e.g., start with the 'answer' and subtract addends to try to reach zero)
 - using basic addition facts (e.g., each of the problems can be solved by simply selecting two of the addends, and writing a number fact (such as $5 + 6 = 11$ for problem 1))
 - looking for smaller groupings (e.g., for $7 + 3 + 2 + 5 + 6 + 4 = 13$, the student may calculate $6 + 4 = 10$ and 3 more gives 13, or $6 + 7 = 13$, so $6 + 2 + 5 = 13$.)
 - eliminating numbers that cannot be used (e.g., for $1 + 5 + 6 + 9 + 3 + 7 = 11$, the student may reason that $9 + 2 = 11$, but there is no '2' available, so the '9' may be discarded)

For the final question, the answer is "yes" for all but #1.

P4W7 (b): Three Wrong Numbers

Students are to cross out three of the addends, leaving three to solve each problem. Each of the problems has at least three solutions, given here:

1. $2 + 6 + 4$ or $2 + 3 + 7$ or $5 + 3 + 4$

2. $1 + 9 + 6$ or $8 + 2 + 6$ or $2 + 5 + 9$

3. $3 + 6 + 4$ or $5 + 2 + 6$ or $7 + 2 + 4$

4. $6 + 1 + 8$ or $9 + 1 + 5$ or $2 + 5 + 8$

5. $7 + 4 + 6$ or $4 + 8 + 5$ or $3 + 8 + 6$

6. $8 + 1 + 4$ or $5 + 1 + 7$ or $2 + 7 + 4$

P4W7 (c): One Wrong Number

The strategies that students use in solving these problems will be an indication of a student's number sense. Students should be encouraged to use estimation and mental math rather than actually adding possible combinations. You could also ask students which questions were the easiest and which were hardest, and why. This will encourage them to analyse the questions and think about their own thinking.

For example, in P4W7(c) when two addends are close in value and one of them is the extra number, it is usually more difficult to determine the correct 'extra' number without actually adding. For instance, in #3, it would appear that either 125 or 141 is the extra number, but further analysis is needed to determine which.

Students could make up similar problems for their classmates. Challenge them to make up some examples such as those in P4W7(c) in which the answer will not be obvious (as it probably is in #2, where 371 is the likely candidate).

Students could also make up questions using multiplication. For example,

Which number does not belong here?. $2 \times 4 \times 5 \times 11 \times 7 = 770$.

For the Students:

P4W7: Wrong Numbers**P4W7 (a): Extra Numbers**

In each row, there are too many numbers to give the total that is shown.

Cross out the extra numbers so that the total is correct.

1. $1 + 5 + 6 + 9 + 3 + 7 = 11$ 4. $2 + 7 + 8 + 5 + 4 + 9 = 15$

2. $7 + 3 + 2 + 5 + 6 + 4 = 13$ 5. $4 + 3 + 5 + 6 + 8 + 1 = 14$

3. $2 + 5 + 8 + 3 + 9 + 4 = 17$ 6. $9 + 4 + 2 + 7 + 3 + 5 = 16$

Find as many solutions as you can for each problem. Is it possible to use every number given in at least one solution?

P4W7 (b): Three Wrong Numbers

For each of these, cross out exactly three numbers.

1. $2 + 5 + 3 + 6 + 4 + 7 = 12$ 4. $6 + 2 + 9 + 1 + 5 + 8 = 15$

2. $8 + 2 + 5 + 1 + 9 + 6 = 16$ 5. $3 + 7 + 4 + 8 + 6 + 5 = 17$

3. $7 + 3 + 5 + 2 + 6 + 4 = 13$ 6. $5 + 8 + 2 + 1 + 7 + 4 = 13$

Each of these has at least three solutions.

Try to find them all.

P4W7 (c): One Wrong Number

Each addition question here has one extra number. Cross out the extra number. Estimate first, then check with your calculator.

1. $\begin{array}{r} 219 \\ 364 \\ 205 \\ 112 \\ \hline 788 \end{array}$	2. $\begin{array}{r} 371 \\ 902 \\ 65 \\ 153 \\ \hline 1120 \end{array}$	3. $\begin{array}{r} 897 \\ 253 \\ 125 \\ 141 \\ \hline 1291 \end{array}$	4. $\begin{array}{r} 723 \\ 689 \\ 237 \\ 591 \\ \hline 1551 \end{array}$
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Example: $\begin{array}{r} 29 \\ 34 \\ 86 \\ \del{15} \\ \hline 149 \end{array}$

5. $\begin{array}{r} 689 \\ 109 \\ 356 \\ 298 \\ \hline 1096 \end{array}$	6. $\begin{array}{r} 247 \\ 86 \\ 736 \\ 95 \\ \hline 1069 \end{array}$	7. $\begin{array}{r} 564 \\ 209 \\ 175 \\ 498 \\ \hline 1237 \end{array}$	9. $\begin{array}{r} 987 \\ 156 \\ 202 \\ 895 \\ \hline 1253 \end{array}$
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In each of these addition questions, there are two extra numbers. Try to decide what they are before using your calculator.

10. $\begin{array}{r} 736 \\ 152 \\ 397 \\ 134 \\ 298 \\ \hline 1168 \end{array}$	11. $\begin{array}{r} 367 \\ 187 \\ 129 \\ 154 \\ 480 \\ \hline 1034 \end{array}$	12. $\begin{array}{r} 896 \\ 750 \\ 225 \\ 471 \\ 370 \\ \hline 1491 \end{array}$	13. $\begin{array}{r} 241 \\ 350 \\ 291 \\ 330 \\ 304 \\ \hline 895 \end{array}$	14. $\begin{array}{r} 632 \\ 187 \\ 192 \\ 526 \\ 757 \\ \hline 1470 \end{array}$
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P4W7 (d): Explain Yourself

Select one of the problems in P4W7(c) and explain how you solved the problem.