

Take-Home Exam 2
Due Tuesday, October 3
Math 300A, Fall 2006

EXPECTATIONS

In addition to finding all legitimate answers you need to justify your solution[s], explaining in detail how you found the answers and why they work. Getting correct answers is certainly important, but understanding the reasoning processes involved and the sense of the problem and its solution are even more important.

Your take home quiz and exams will be evaluated using all of these criteria. See rubric below.

A correct answer with no supporting explanation will receive no credit. A reasonable but incorrect or incomplete answer together with the calculations that produced it will receive partial credit.

In order to receive full credit, you must:

1. state the problem clearly, preferably in your own words;
2. explain how you went about solving the problem, including any assumptions you may have made;
3. show any examples, data, or calculations you used, in a clear and organized way (this may include diagrams, lists, tables, graphs, or other visual displays);
4. state complete and correct answer[s];
5. explain why this is a reasonable solution to the problem.

Note that the requirements mirror Polya's steps of understanding: stating the problem (1), devising a plan (2), carrying out the plan(3) , and then looking back (5).

Your work should be typed or word-processed, though calculations and tables or other graphic displays may be hand-drawn.

The rubric for problems 2 and 3 below will be the same as the one for the initial quiz (10 points each for problems 2 and 3, split as on the quiz). For problem 1, each part will be worth 5 points.

Problems

1. And the winning base is...

a) Use the method of your choice to determine the base b in which $72_{\text{ten}} = 132_b$?

In solving parts b and c, use pictures of manipulatives and do not translate to base 10, or even regroup in base 10, except as a check. Graph paper may be helpful.

b) Subtract: $503_{12} - 19E_{12}$

= _____

c) $126_9 =$ _____

2. Whew, now a return to base 10! A certain number has 5 digits and looks like "VWXYZ". If you make it into a six-digit number by putting a 1 as the digit to the right [making it look like "VWXYZ1"], your result is three times what you get by forming a six-digit number from the unknown number with a 1 as the leftmost digit ["1VWXYZ"]. Oh, by the way, it is possible that the digits are not all different. Find the number!

3. The Weight Lifters Association of America has sets of weights for beginners are located around the country in each of its local fitness clubs. Each club's set of weights has 15 of these weights that weigh exactly 1, 2, 3,...up to 15 pounds. Your job involves travel to each of these clubs to check that the

weights are exactly correct. At your Rohnert Park headquarters, you have available a complete set of 15 weights which are known to be exact. You'll take some of the official weights with you, along with a balance for comparing, but you want to keep your luggage as light as possible. What set of weights might you take with you? Are there other possible sets that are just as light?