MATH ϟ☽⋆ Final Exam 12/19/12 1:30–4:00

Some notes:
This exam consists of 7 problems.
Try to relax and read over the exam. Do your favorite problem first.
Please ask me if you get stuck. I may not help, but it can't hurt to ask.

(1) Compute the product 24×35

   (a) the usual American way, and

   (b) using a picture.

   Show specifically how each of the parts of the usual way of working the problem relate to each part of the picture.

(2) Compute $432 \div 7$ using

(a) long division, and

(b) relaxed repeated subtraction.

Show your work.

(3) Convert

(a) the happy number $\lightning\square\Delta\heartsuit$ into an Arabic number, and

(b) the Arabic number 276 into a happy number.

Show your work clearly.

(4) (a) Find two different names for $\frac{3}{5}$ (besides $\frac{3}{5}$). Explain why these are names for the same fraction value.

(b) Find a fraction between $\frac{11}{18}$ and $\frac{5}{8}$.

(c) Explain carefully why the fraction you found in (b) is larger than $\frac{11}{18}$, and why it is smaller than $\frac{5}{8}$.

(5) Consider the subtraction problem $82 - 54$.

(a) Describe how you could find the answer to that problem.

(b) Explain why the method you used to find the answer will give a correct answer.

(c) Give a word problem to show where this subtraction problem might arise in real life.

(6) (a) Write a word problem that is solved by performing the division $1\frac{1}{6} \div \frac{2}{3}$.

(b) Solve the problem without using "invert and multiply" or "cross multiplying." Explain your steps.

(7) Sue and Fred found a wallet without identification but with lots of money inside. Sue claimed that she saw it first so she should get $\frac{2}{3}$ of it. Fred thought they should first give half of the money to charity so they'd have good karma. So they gave half the money to charity. Sue took $\frac{2}{3}$ of what was left and Fred took the rest. Fred then gave \$5000, which was $\frac{1}{2}$ of his money, to a homeless shelter since he still felt a little guilty taking any of the money. How much money was originally in the wallet?