

1. Fill in the missing digits. Prove that the solutions are unique. Assume the divisions have no remainders.

- 2. Royal Forks and Knives Problem. The Queen's pantry has one drawer that contains forks and knives. The Royal servants take some of them out to set the table for a Royal dinner. Every individual table setting has exactly one fork and one knife. The servants use 2/3 of the forks and 3/5 of the knives in the drawer.
  - (a) Consider the fraction of the total number of knives and forks that are being used for the Royal dinner. How many different fractions are possible?
  - (b) Find a formula that tells you the fraction in use if you know the fraction of forks in use and fraction of knives in use?
- 3. Constructively prove that between any two distinct fractions there is another fraction. That is, I want a formula for such a fraction given

the surrounding fractions.

- 4. (a) Write a formula for subtracting fractions of the same denominator and justify it using our part-whole definition of fraction.
  - (b) Derive a general formula for subtraction of fractions using our golden rule of equivalence and (4a).