Fri, Sept 28, 2012 **MATH 210** **Quiz 4**

Name: (print) *Solutions.*

Each problem is worth 2 points. Show all your work.

1. Solve the following using the subtraction algorithm. Order these computations from easiest to hardest. Explain your reasoning.

$$\begin{array}{r} {\scriptstyle 7\,1\,4\;\;} \\ \cancel{8}\cancel{2}\cancel{5}6 \\ -\;6589 \\ \hline 1667 \end{array} \qquad \begin{array}{r} {\scriptstyle 7\;9\,9\,13} \\ \cancel{8}003 \\ -\;6007 \\ \hline 1996^{*} \end{array} \qquad \begin{array}{r} 8256 \\ -\;7145 \\ \hline 1111 \end{array}$$

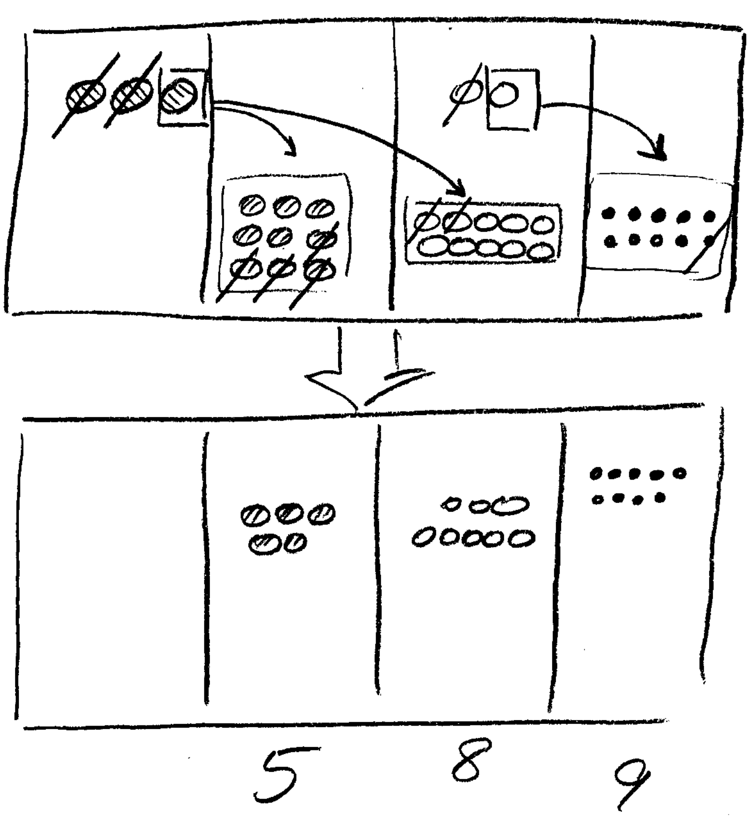
hardest (3 unbundling / carrying operations)

intermediate (regrouping across two zeros, then easy)

easiest (no carrying)

* mental math: $8003-6007 = 8007-6007-4 = 2000-4 = 1996.$

2. Illustrate the problem of finding the value of $3020 - 2431$ using a chip model. Show the steps of the subtraction algorithm. Which place values required rebundling (ones, tens, hundreds...), and which required bundling across zero?




Algorithm:

Subtract ones:

$$\begin{array}{r} 30\cancel{2}0 \\ 2431 \\ \hline 9 \end{array}$$

(unbundle one ten)

Subtract hundreds:

Unbundle 1 thousand

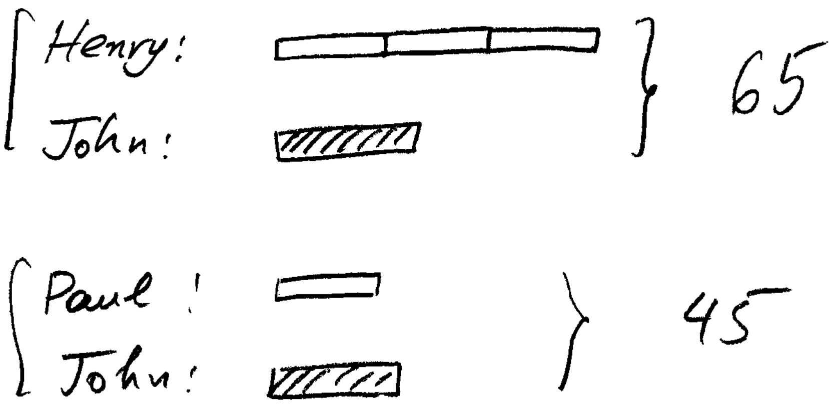
$$\begin{array}{r} {\scriptstyle 2\;9\;11\;} \\ \cancel{3}\cancel{0}\cancel{2}0 \\ -\;2431 \\ \hline 89 \end{array}$$

Subtract hundreds and thousands:

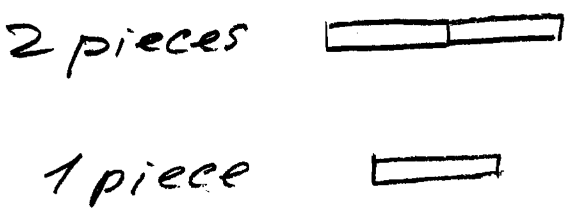
$$\begin{array}{r} {\scriptstyle 2\;9\;11\;} \\ \cancel{3}\cancel{0}\cancel{2}0 \\ 2431 \\ \hline 589 \end{array} \qquad \boxed{589}$$

Please turn over...

3. Give a "teacher's solution" to the problem using bar diagrams and step-by step instructions: *John and Paul spent $45 altogether. John and Henry spent $65 altogether. If Henry spent 3 times as much as Paul, how much did John spend?*




← subtract




$= 65-40=20$

$= 20 \div 2 = 10$

Paul saved $10.

John saved $45-10=35$ dollars.