**MASSACHUSETTS MATHEMATICS LEAGUE**
**CONTEST 2 - NOVEMBER 2011**
**ROUND 2 ALGEBRA 1: ANYTHING**

**ANSWERS**

A) _____ inches

B) _____

C) _____

****** NO CALCULATORS IN THIS ROUND ******

A) A rectangular piece of cardboard is 4" by 6".
Squares of equal size are cut from each of the 4 corners.
If the total area of the cutouts is 37.5% of the area of the original piece of cardboard, compute the length (in inches) of the side of the squares cut from each corner.

B) When a two-digit number is divided by the sum of its digits, the quotient is 7 and the remainder is 0. When the same number is multiplied by the sum of its digits, the product is 567. Find this number.

~~**Joe Ford – 2009**~~
~~When a two-digit number is divided by the sum of its digits, the quotient is 7.~~
~~When the same number is multiplied by the sum of its digits, the product is 567.~~
~~Find this number.~~

~~Ans: 63~~

$$\begin{cases} (1)\ \ 10t+u=7(t+u) \\ (2)\ \ (10t+u)(t+u)=567 \end{cases}$$

~~(1) → $t=2u$~~

~~Substituting for $10t+u$ in (2), $7(t+u)^2=567$ → $(t+u)^2=81$ → $t+u=3u=9$~~

~~→ $u=3$, $t=6$ → **63**~~