MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 4 – JANUARY 2007
ROUND 4 ALG 2: QUADRATIC EQUATIONS

ANSWERS

A) (_____ , _____)

B) a b c d e f

C) _____ oz.

A) The vertex of the parabola $y = (x - 1)(x - a) + b$ is located at (3, 7).
Determine the ordered pair (a, b).

B) Let a, b, and c, in some order, denote three consecutive positive integers.
Indicate which of the following orders of (a, b, c) guarantees that the sum of the roots of $ax^2 - \underline{b}x + c = 0$ is as <u>large</u> as possible.
(S, M and L denote the smallest, the middle and the largest integer.)

a) (S, M, L) b) (S, L, M) c) (M, S, L) d) (M, L, S) e) (L, M, S) f) (L, S, M)

C) 24 ounces of copper are drawn into a wire of uniform cross section. If the wire had been one foot longer (and still of the same uniform cross section), the wire would have weighed 0.1 oz. less per foot.
This wire is used to make 4" high letters, as shown below.
The grid squares are 1 inch on side.
If no extra wire is used to make the bends, find the weight of the wire used.
Give an exact answer or an approximation accurate to the nearest 0.01 ounce.