MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 6 - MARCH 2014
ROUND 4 ALG 1: ANYTHING

ANSWERS

A) _____

B) _____

C) _____

A) Compute the absolute value of the difference between 2345_6 and 1456_7.
Express the difference in base 10.

B) The line $\mathcal{L}$ whose equation is $13x + 7y = 92$ passes through exactly one lattice point $P(x_1, y_1)$ in quadrant 1 and infinitely many lattice points in quadrants 2 and 4. Let $Q(x_2, y_2)$ be the lattice point on $\mathcal{L}$ in quadrant 2 closest to P and $R(x_4, y_4)$ be the lattice point on $\mathcal{L}$ in quadrant 4 closest to P. Compute $y_1 + y_2 + y_4$.

Recall: Lattice points are points whose coordinates are integers.

C) There were 12 contestants on "The Biggest Losers" weighing a total of 4500 lbs. Two contestants dropped out before filming started. The average weight of the remaining contestants at the outset was 385 lbs. The average weight loss L for the 10 contestants who made it to the final weigh-in equals 40% of the average weight of the two contestants who dropped out. Compute W, the average weight of the contestants who made it to the final weigh-in.