MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 6 - MARCH 2013
ROUND 4 ALG 1: ANYTHING

ANSWERS

A) (_____ , _____)

B) _____

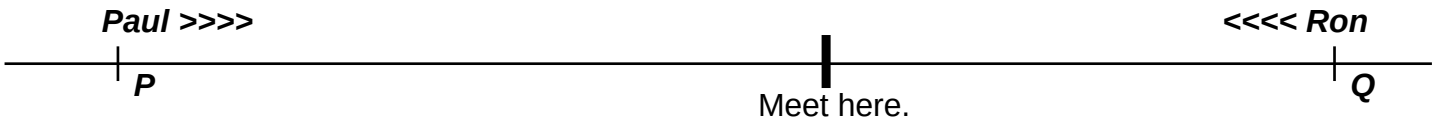
C) (_____ , _____)

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

A) A mathlete promises his coach that he will participate in all 6 MML meets in 2012-13.
He was disappointed in his performance in the first two meets, despite improving from 0 points in the first contest to 4 points in the second contest. His goal is to average 6 points per meet for the year – a personal best! An average score of N in the last 4 meets would allow him to reach his goal.
He actually scored 6, 10 and 12 in meets 3, 4 and 5.
If he scores k points in meet #6, he reaches his goal, a personal best!
Compute the ordered pair (k, N).

B) The difference $\left(6x^2-8x+11\right)-\left(-5x^2+kx+10\right)$ factors over the integers as a unique pair of binomials for exactly one positive value of k. Compute k.

C) Paul started at P and ran towards Q. He ran a mile in 6 minutes.
Ron started at Q and ran towards P. He ran a mile in 9 minutes.
They both started running at the same time and met 1 hour later.



After a month of training, Paul, an avid runner, was able to reduce his mile time by 1 minute.
After a month of "training", Ron, a convicted couch potato, took 1 more minute per mile.

Running over the same course, the elapsed time until they met actually decreased by A minute and B seconds. Compute the ordered pair (A, B).
If necessary, round B to the nearest integer.