MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 4 - JANUARY 2014
ROUND 4 ALG 2: QUADRATIC EQUATIONS

ANSWERS

A) _____

B) _____

C) _____

A) Let *P* be the positive difference between the roots of $x^2 - 13x + 30 = 0$.
Let *Q* be the positive difference between the roots of $x^2 - 13x - 30 = 0$.
Compute *P* + *Q*.

B) The sum of the roots of $2Ax^2 - Bx + C = 0$ is *AC*.
If *A*, *B* and *C* are integers and *C* > 10, compute the minimum value of *C* for which *B* is guaranteed to be a perfect square.

C) Solving a radical equation sometimes requires squaring both sides, rearranging the terms and squaring both sides again. However, doing this can introduce extraneous answers. Applying this strategy to $5 - \sqrt{x+2} = 3\sqrt{x-5}$ produces an extraneous integer solution, as well as a fractional solution that checks. Compute the fractional solution and leave your answer as a simplified ratio of integers.