MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 4 - JANUARY 2016
ROUND 4 ALG 2: QUADRATIC EQUATIONS

ANSWERS

A) _____

B) _____

C) _____

A) It is not uncommon for an equation, like $x^2 = 38x - N$, to have two real solutions. For example, when $N = 280$, $x = 10$ or 28. Determine the unique value of the constant N for which the quadratic equation has exactly one solution.

B) Compute the product of the cubes of the rational roots of $\left(x+\frac{4}{x}\right)^4 - 17\left(x+\frac{4}{x}\right)^2 + 16 = 0$.

C) The equation $x^2 - kx + 2k = 2x$ has one root which is 3 greater than the other root. If the roots are R_1 and R_2, find all ordered triples (R_1, R_2, k), where $R_1 > R_2$.