MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 4 - JANUARY 2010
ROUND 4 ALG 2: QUADRATIC EQUATIONS / THEORY OF QUADRATICS

ANSWERS

A) _____

B) _____

C) _____

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

A) Consider the following quadratic equation: $x^2 + 3x + 2M = 0$

If $M = a$, the constant term is 3 greater than the coefficient of x^2.
If $M = b$, the equation has equal roots.
If $M = c$, the product of the roots is 10.
Compute the product abc.

B) Find all values of the constant k for which the roots of the quadratic equation

$$y^2 + k^2y = 5ky + 6y + 7$$

are numerically equal, but <u>opposite</u> in sign.

C) The line $2x - y + 7 = 0$ intersects $y = Ax^2 + Bx + C$ at $x = -2$ and $x = 7$.
The low point V has coordinates $(1, -3)$
Compute the value of C.