MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 5 – FEBRUARY 2010
ROUND 1 ALGEBRA 2: ALGEBRAIC FUNCTIONS

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

ANSWERS

A) _____

B) _____

C) (_____ , _____ , _____ , _____)

A) Given: $f : \left\{ \left(x, f(x)\right) \mid f(x) = \dfrac{3}{x+2} \right\}$

Find the (x, y) coordinates of <u>all</u> points of intersection between f and f^{-1}.

B) In the equation $2x^4 - 7x^3 - 2x^2 + 13x + 6 = 0$, the four roots are A, B, C and D.
Compute $ABC + ABD + ACD + BCD$.

C) Let $f(x) = Ax^3 + Bx^2 + Cx + D$.

If $f(-a) = -f(a)$, $f(-3) + 2f(3) + f(5) = 3$ and one zero of $Ax^3 + Bx^2 + Cx + D = 0$ is 4, determine the ordered quadruple (A, B, C, D).