

**MASSACHUSETTS MATHEMATICS LEAGUE**  
**CONTEST 5 – FEBRUARY 2009**  
**ROUND 1 ALGEBRA 2: ALGEBRAIC FUNCTIONS**

**ANSWERS**

A) \_\_\_\_\_

B) \_\_\_\_\_

C)  $c =$  \_\_\_\_\_

A) Let  $f(x) = \begin{cases} -x^3 & \text{for } x < 0 \\ x+1 & \text{for } 0 \leq x \leq 1 \\ -7 & \text{for } x > 1 \end{cases}$ . Compute:  $f(f(3)) + f(-1) + f(f(1/4))$

B) Let  $f(x) = x - \frac{1}{x}$ ,  $x > 0$ . Compute  $f^{-1}\left(\frac{5}{6}\right)$ .

C) Given:  $f(x) = ax^2 + bx + 3$ ,  $f(2) = 3$  and  $f(-1) = 9$   
Find  $c < 0$  such that  $f(c) = f(4)$ .