

**MASSACHUSETTS MATHEMATICS LEAGUE  
CONTEST 5 – FEBRUARY 2012  
ROUND 1 ALGEBRA 2: ALGEBRAIC FUNCTIONS**

**ANSWERS**

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

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

C) \_\_\_\_\_

<b>***** NO CALCULATORS ON THIS ROUND *****</b>
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A) Let  $f(x) = \begin{cases} 4x+5 & \text{for } x > 2 \\ 10 & \text{for } -2 < x \leq 2 \\ 3x-4 & \text{for } -10 \leq x \leq -2 \end{cases}$  Compute:  $f(f(2)) + f(f(-2)) + f(0)$

B)  $f(x)$  is a function of minimum degree with integer coefficients and zeros of  $-1$ ,  $\sqrt{6}$  and  $i$ .  
If the lead coefficient is positive and the greatest common factor of the coefficients is 1,  
compute the ratio  $2f(-2) : 3f(3)$ .

C) Given  $f(x) = \frac{x+1}{x-1}$  Express  $f(2x)$  in terms of  $f(x)$ .