

**MASSACHUSETTS MATHEMATICS LEAGUE**  
**CONTEST 4 – JANUARY 2008**  
**ROUND 2 ALG 1: FACTORING AND/OR EQUATIONS INVOLVING FACTORING**

**ANSWERS**

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

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

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

A) Find all values of  $a$  so the expression  $4x^2 + 8ax + 25$  is a perfect trinomial square.

B) For some integer values of  $a$ , the expression  $x^2 + ax - 15$  may be written as the product of two binomials with integer coefficients.  
For which of these values of  $a$ , does the expression  $ax^2 + 98$  have two distinct linear factors with integer coefficients?

Note: A linear factor has the form  $mx + b$ , where  $m \neq 0$ .

C) Find all real values of  $x$  for which  $\frac{2x^2 + x - 1}{x^2 - x - 2} = 1 - 2x$