

MASSACHUSETTS MATHEMATICS LEAGUE  
OCTOBER 2004  
ROUND 4 ALG 1: FRACTIONS & MIXED NUMBERS

\*\*\*\*\* NO CALCULATORS ON THIS ROUND \*\*\*\*\*

ANSWERS

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

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

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

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A) Find the exact solution for  $\frac{x-1}{2} - \frac{x-3}{4} - \frac{x-5}{6} = \frac{x-7}{8}$

- B) Consecutive unit fractions are those having numerators of 1 and denominators that are consecutive integers. Suppose  $a$  and  $b$  are consecutive unit fractions satisfying

$$a > \frac{\pi}{12} > b$$

Express  $\frac{2ab}{a+b}$  as a simplified ratio of integers.

- C) At  $A\frac{B}{C}$  minutes exactly after four o'clock p.m. (but before five o'clock) the minute and hour hands of a clock are perpendicular. Find the product of the two solutions for  $A\frac{B}{C}$  and express the answer as a simplified mixed number.