

**MASSACHUSETTS MATHEMATICS LEAGUE  
OCTOBER 2005  
ROUND 4 ALG 1: FRACTIONS & MIXED NUMBERS**

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

**ANSWERS**

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

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

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

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- A) A ream (500 sheets) of letter size paper ( eight and a half by eleven inches) is  $2\frac{1}{8}$  inches thick. If the volume of a single sheet as a simplified fraction is  $\frac{a}{b}$  cubic inches, find  $a + b$ .
- B) Egyptians wrote fractions as sums of unit fractions ( $\frac{1}{n}$ ). If we write  $\frac{5}{18}$  as  $\frac{1}{a} + \frac{1}{b}$  and  $\frac{4}{9}$  as  $\frac{1}{b} + \frac{1}{a} + \frac{1}{b}$ , find the value of  $a + b$ .
- C) My hose will fill my pool in 14 hours; the pool's drain empties the pool in 8 hours. At 6 a.m. my pool was empty so I closed the drain and turned on the hose. When the pool was half full, the drain accidentally opened! At what time did my pool become empty again? (Specify a.m. or p.m.)