

**MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 2 - NOVEMBER 2007 SOLUTION KEY**

Round 2

A) Let n denote the number of numbers in the set. Then $20n + 300 = 35n \rightarrow n = \underline{20}$

B) Multiplying by $(k-2)(k-1)$, $k^2 + 9 - 6(k-2) = 2k(k-1)$
 $\rightarrow k^2 + 9 - 6k + 12 = 2k^2 - 2k \rightarrow k^2 + 4k - 21 = (k+7)(k-3) = 0 \rightarrow k = \underline{-7, 3}$

C) $(\frac{1}{12} + \frac{1}{27} + \frac{1}{2x} + \frac{1}{3x})6 = 1 \rightarrow \frac{5}{6x} = \frac{1}{6} - \frac{1}{12} - \frac{1}{27} \rightarrow \frac{5}{2x} = \frac{1}{2} - \frac{1}{4} - \frac{1}{9} = \frac{5}{36} \rightarrow x = 18$
 \rightarrow daughter would take **54 minutes**