

**MASSACHUSETTS MATHEMATICS LEAGUE**  
**CONTEST 1 - OCTOBER 2013**  
**ROUND 4 ALG 1: FRACTIONS & MIXED NUMBERS**

**ANSWERS**

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

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

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

A) Working alone,  $A$  can do a job in 6 days,  $B$  can do the same job in  $x$  days and  $C$  in  $(2x)$  days. If  $A$  works alone for 4 days and stops,  $B$  and  $C$  can work together and finish the remainder of the job in 3 days. Working alone, in how many days could  $C$  do the whole job by himself?

B) The current time is 9:10.  
My GPS says I will arrive at my destination at 10:04. (Of course this assumes that I am travelling at an average speed equal to the speed limit for the entire trip. The speed limit is 45mph.)  
I am in a hurry and wish to get to my destination by 10:00. Compute my average speed (in mph), if I was able to reach my destination at exactly 10:00.

C) Given:  $4AB - 3XA + 4XB - 3AXB = 12AB$   
Solve for  $A$  in terms of  $B$  and  $X$ .  
Find a simplified expression for  $X$  in terms of  $B$  which guarantees that  $A$  is undefined.