

**MASSACHUSETTS MATHEMATICS LEAGUE**  
**CONTEST 4 - JANUARY 2012**  
**ROUND 6 ALG 1: ANYTHING**

**ANSWERS**

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

B) ( \_\_\_\_\_ , \_\_\_\_\_ )

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

A) 10W30 oil protects a car engine for air temperatures  $T$  which satisfy the inequality

$$|T - 55| \leq 50.$$

If  $T_{\text{low}}$  and  $T_{\text{high}}$  denote the low and high air temperatures for safe range of operation, compute  $T_{\text{low}} + T_{\text{high}}$ .

B) Carol starts at 1000 and counts down by 7s. Carol's list starts out 1000, 993, 986, ...  
Tarah starts at 100 and counts up by 13s. Tarah's list starts out 100, 113, 126, ...  
Let  $C$  and  $T$  denote numbers in Carol's and Tarah's list respectively between 600 and 700.  
Compute the ordered pair  $(C, T)$ , where  $|C - T|$  is a minimum.

C) Two walkers, Chris and Christine, initially 12 miles apart, walk towards each other and meet in 1 hour and 20 minutes. Chris and Christine walk at constant, but different rates. The faster walker walks twice as fast as the slower walker. Suppose they walk at these rates in the same direction, starting from the same point at the same time.  
Compute the time (in seconds) when they are exactly  $\frac{1}{4}$  mile apart.