MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 2 – NOVEMBER 2008 SOLUTION KEY

Round 2

A) Subtracting 2009 from both sides and squaring, $x-2009=(x-2009)^2$
Since this equation is of the form $k = k^2$, which has solutions $k = 0, 1$, we have $x =$ **<u>2009, 2010</u>**.

B) $x-\frac{6}{x}=\frac{5}{2} \rightarrow 2x^2 - 12 = 5x \rightarrow 2x^2 - 5x - 12 = 0 \rightarrow (2x + 3)(x - 4) = 0 \rightarrow x =$ **<u>–3/2, 4</u>**

C) $\begin{cases} F=\frac{5}{9}C-32 \\ F=C \end{cases} \rightarrow 5C - 288 = 9C \rightarrow 4C = -288 \rightarrow C = F = -72$

Either from recall or solving the system $\begin{cases} F=\frac{9}{5}C+32 \\ F=C \end{cases}$, $C = F = -40$

Thus, $-40 - (-72) =$ **<u>32</u>**