

**MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 4 - JANUARY 2012 SOLUTION KEY**

Team Round – continued

F) Suppose the price on a Frisbee is \$X.

Adding a 5% sales tax, the original cost to the customer was $X + 0.05X = 1.05X$ (dollars).

The current cost is $1.08 \cdot 1.25X$ (dollars) – an 8% sales tax added to the increased selling price.

The difference is \$0.48.

$$1.08(1.25X) - 1.05X = 0.48$$

$$\Leftrightarrow X(108(1.25) - 105) = 48$$

$$\Leftrightarrow X\left(108\left(\frac{5}{4}\right) - 105\right) = 48$$

$$\Leftrightarrow X(135 - 105) = 48$$

Thus, $X = \frac{48}{30} = \frac{8}{5} = 1.6$ and the original selling price of the Frisbee was exactly **\$1.60**.