**MASSACHUSETTS MATHEMATICS LEAGUE**
**CONTEST 4 - JANUARY 2009**
**ROUND 6 ALG 1: ANYTHING**

**ANSWERS**

A) _____

B) _____

C) $y$ = _____

A) Find the value(s) of $x$ for which

$$\sqrt{8^4+4^6+16^3+64^2}\cdot\sqrt{x^2}=\sqrt{64^3}$$

B) At 2:00 the hour and minute hands of an analog clock form a 60° angle.
Between 2 and 3 o'clock, this happens again at exactly $x$ minutes past 2 o'clock.
Determine the value of $x$. Express your answer as the ratio of two relatively prime integers.

C) Consider the following operations on real numbers: $x \circ y = 2x - y$ and $\overline{x} = x^2$
If $\overline{(x \circ y)} = \overline{x} \circ \overline{y}$, then find a simplified expression for $y$ in terms of $x$.