MASSACHUSETTS MATHEMATICS LEAGUE
FEBRUARY 2006
ROUND 3 TRIG: IDENTITIES & INVERSE FUNCTIONS
ANSWERS

A) $Y =$ _____

B) _____

C) _____

A) Suppose Arctan($\sqrt{x}$) = d, where $0° < d < 90°$. If d = Arcsec(Y), express Y in terms of x.

B) Simplify $\dfrac{\sin\theta}{2(1+\cos\theta)} + \dfrac{1+\cos\theta}{2\sin\theta}$ to obtain a single trigonometric function of θ.

C) If $\sin(4\theta)$ is written in the form $A\sin\theta\cos\theta(B + C\sin^2\theta)$ for integers A, B and C, find $A^2 + BC$.