

MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 4 – JANUARY 2008
ROUND 3 TRIG: EQUATIONS WITH A REASONABLE NUMBER OF SOLUTIONS

ANSWERS

A) _____

B) _____

C) _____

***** NO CALCULATORS ON THIS ROUND *****

A) Solve for x over $0 \leq x < 2\pi$: $2(\cos x - \sin x) = 1 - \tan x$

B) Solve for x over $0 \leq x < 360^\circ$. $\sin 140^\circ \cos 220^\circ = \frac{\cos x}{\sec 60^\circ}$

C) There are n values of x , where $0^\circ \leq x < 360^\circ$ that satisfy: $\tan^2 x \cdot \sec^2 x + 1 = \tan^2 x + \sec^2 x$
Let S denote the sum of these solutions. Compute $S - n$.