MASSACHUSETTS MATHEMATICS LEAGUE
NOVEMBER 2004
ROUND 5 TRIG: FUNCTIONS OF 30, 45, 60 & 90

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

ANSWERS

A)_____

B)_____

C)_____

A) Find the exact value in simplified radical form of:

$$\csc(-675°) + \cos(120°) + 2\sin^2(420°) - \tan^2(-330°) + \cot^2(780°)$$

B) Solve for all x, $0° \leq x < 360°$: $\qquad \sin(2x) - \sin(-x) = 0$

C) In the figure below, find the value of DH in simplified radical form if:

$$\sin(\angle FDH) = \cos(\angle A) = \cos(\angle ACB) = 0.5, \quad CF = FD, \quad AB = 10\sqrt{3} ,$$
$$\cot(\angle CFD) = \cos(\angle CBD) = \cot(\angle H) = 0, \text{ and } \cot(\angle BDH) = -1$$