

MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 4 - JANUARY 2017
ROUND 3 TRIG: EQUATIONS WITH A REASONABLE NUMBER OF SOLUTIONS

ANSWERS

A) _____°

B) _____

C) _____

A) Given: $\cos 36^\circ = \frac{\sqrt{5}+1}{4}$

Solve for x , where $180^\circ < x < 270^\circ$: $\sin(x+6^\circ) = -\frac{\sqrt{5}+1}{4}$

B) Solve over $0 < x < \pi$: $4\sin^3 x - 4\sin^2 x - 3\sin x + 3 = 0$

C) Given: $\left(4^{\sin^2 x}\right)\left(4^{\cos^2 x}\right)\left(4^{\tan^2 x}\right) = \sqrt[3]{128}$

Compute $\cos 2x$