MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 2 - NOVEMBER 2012
ROUND 5 TRIG: FUNCTIONS OF SPECIAL ANGLES

ANSWERS

A) _____

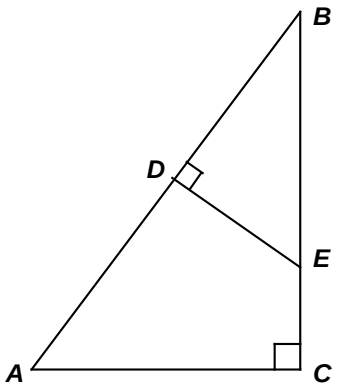
B) _____

C) _____

A) In ΔABC, the measures of the angles are $x°, \frac{x}{5}°$ and $\frac{3x}{10}°$. Compute $2\cos^2(x°)-1$.

B) Given: $\cos(\angle BED)=\frac{3}{5}$

Compute $\cot^2 A+\cos(\angle DEC)$.



C) Suppose $A = 60°$. There are many ordered pairs (k, B) of relatively prime positive integers that are solutions of $k\tan\left(\frac{A}{2}\right)=\sin 2A+B\sin A$. Of those pairs compute the <u>smallest prime</u> value of the sum $k + B$.