MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 3 – DECEMBER 2012
ROUND 1 TRIG: RIGHT ANGLE PROBLEMS, LAWS OF SINES AND COSINES

ANSWERS

A) _____

B) _____

C) _____

A) Compute the sine of the smaller acute angle in a right triangle whose hypotenuse has length 37 and whose long leg has length 35.

B) In square *ABCD*, points *E* and *F* lie on $\overline{AD}$ and $\overline{AB}$ respectively such that *AE* : *DE* = 2 : 1 and *AF* : *FB* = 2 : 1. Compute $\cos(\angle FCE)$.

C) In ΔABC, $\frac{BC}{AC} = \frac{2}{\sqrt{7}}$. Compute $7\cos^2 A - 4\cos^2 B$.