MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 3 – DECEMBER 2009
ROUND 1 TRIG: RIGHT ANGLE PROBLEMS, LAWS OF SINES AND COSINES

******* NO CALCULATORS IN THIS ROUND *******

ANSWERS

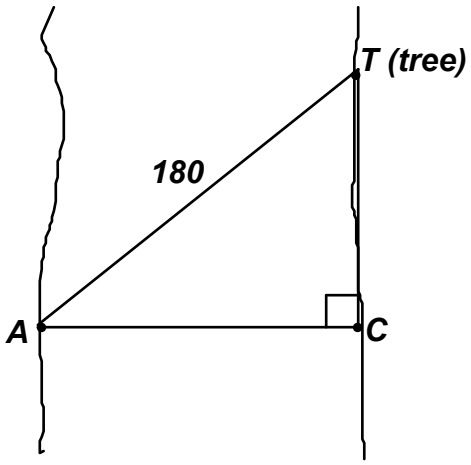
A) _____

B) _____

C) _____

A) From point A on a river bank, the distance to a tree on the opposite bank is 180 meters.

If $\tan(\angle TAC) = \frac{\sqrt{5}}{2}$, compute AC, the width of the river.



B) In <u>acute</u> ΔABC, $m\angle C = 30°$, $AB = 4$ and $AC = n$, where n is an integer. Determine how many values of n are possible?

C) In ΔABC, $m\angle A = 30°$, $a = 10$, $b = 15$ and $\angle B$ is as large as possible. Determine the <u>exact</u> value of $\sin C$.