MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 1 - OCTOBER 2008
ROUND 2 PYTHAGOREAN RELATIONS IN RECTILINEAR FIGURES

ANSWERS

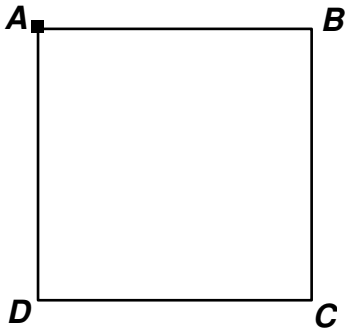
A) _____ rungs

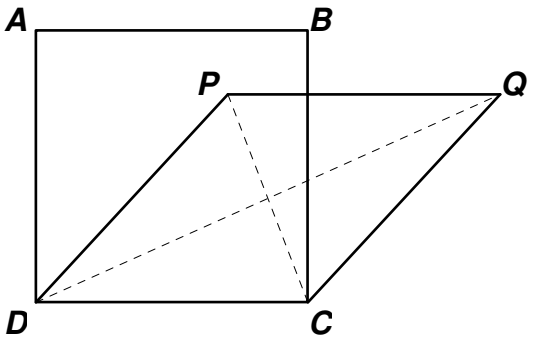
B) _____

C) _____

A) A ladder has rungs 1 foot apart, starting 1 foot from each end.
The bottom of the ladder is 15 feet from the base of a wall when the top of the ladder reaches a point on the wall 36 feet above the ground. How many rungs on this ladder?

B) Four straws of equal length are held together by a string running through them. The ends of the string are tied together at A to form the square $ABCD$. Applying a little pressure at point A, while holding $\overline{DC}$ fixed, the rhombus $PQCD$ is formed. If $AB = 50$ and the diagonals of the rhombus have integer length. Compute the minimum value of $PC + QD$.





C) Find two values of x so that a triangle with sides of length $x - 1$, $2x - 6$ and $x + 3$ will contain a right angle.