

MASSACHUSETTS MATHEMATICS LEAGUE
DECEMBER 2005
ROUND 6 GEOMETRY: POLYGONS
ANSWERS

A) _____

B) _____

C) _____

A) ABCDEFGHI is a regular polygon. \overline{AB} and \overline{CD} are extended to meet at P. Find $m\angle BPC$.

B) If three consecutive sides of a convex quadrilateral have corresponding lengths of 5, 7, and 6 and the fourth side also has integral length, how many different possible lengths are there for that fourth side?

C) A rhombus has a perimeter of 60 and diagonals whose lengths are in the ratio 3:4. The longer diagonal of the rhombus is also the larger diagonal of a regular hexagon. The smaller diagonal of the rhombus is the altitude of an equilateral triangle. Find the ratio of the perimeter of the equilateral triangle to the perimeter of the regular hexagon..