

**MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 3 - DECEMBER 2010
ROUND 6 PLANE GEOMETRY: POLYGONS (no areas)**

ANSWERS

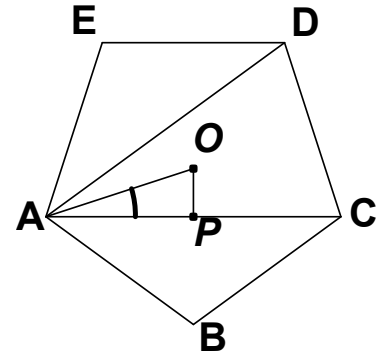
A) _____

B) _____ °

C) _____

****** NO CALCULATORS ON THIS ROUND ******

- A) O is the center of regular pentagon $ABCDE$ and $\overline{OP} \perp \overline{AC}$. A regular polygon has an exterior angle with the same measure as the marked angle? How many sides does this polygon have?



- B) In isosceles trapezoid $ABCD$, where $\overline{AB} \parallel \overline{CD}$, the diagonals intersect at point E . If $m\angle DEC = 3 \cdot m\angle BAE$ and $m\angle DAE : m\angle ADE = 5 : 4$, compute $m\angle BCE$.

- C) $ABCD$ is a parallelogram.

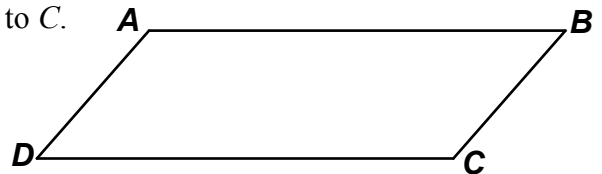
Let M and N lie on \overline{AB} . M is closer to A and N is closer to B .

$AM : MB = 2 : 7$, $AN : NB = 5 : 4$

Let P and Q lie on \overline{CD} . P is closer to D and Q is closer to C .

$DP : PC = 1 : 5$, $DQ : QC = 5 : 7$

Compute $MB : PC$.



Created with