# HMMT February 2026

**February 14, 2026**

## Geometry Round

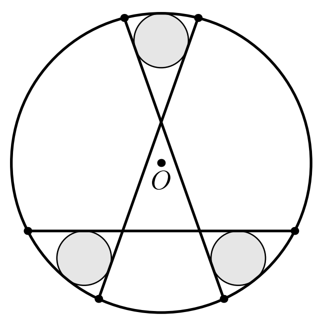
1. Let $ABCD$ and $WXYZ$ be squares such that $W$ lies on segment $\overline{AD}$, $X$ lies on segment $\overline{AB}$, and points $Y$ and $Z$ lie strictly inside $ABCD$. Given that $AW = 4$, $AX = 5$, and $AB = 12$, compute the area of triangle $\triangle BCY$.

2. Let $HORSE$ be a convex pentagon such that $\angle EHO = \angle ORS = \angle SEH = 90^\circ$ and $\angle HOR = \angle RSE = 135^\circ$. Given that $HO = 20$, $SE = 26$, and $OS = 10$, compute the area of $HORSE$.

3. Let $ABCD$ be a rectangle with $AB = 12$ and $BC = 16$. Points $W$, $X$, $Y$, and $Z$ lie on sides $\overline{AB}$, $\overline{BC}$, $\overline{CD}$, and $\overline{DA}$, respectively, such that $WXYZ$ is a rhombus with area 120. Compute $XY$.

4. Let $ABC$ be a triangle with $\angle BAC = 90^\circ$. Points $X$ and $Y$ are such that $B$, $X$, $Y$, and $C$ lie on segment $\overline{BC}$ in that order, $BX = 4$, $XY = 5$, and $YC = 3$. Let $T$ be a point lying on segment $\overline{AC}$ such that $TA = TX = TY = \ell$ for some $\ell$. Compute $\ell$.

5. In the diagram below, three circles of radius 2 are internally tangent to a circle $\Omega$ centered at $O$ of radius 11, and three chords of $\Omega$ are each tangent to two of the three circles. Given that $O$ lies inside the triangle formed by the three chords and two of the chords have length $4\sqrt{30}$, compute the length of the third chord.




6. Let $ABC$ be a triangle, and $M$ be the midpoint of segment $\overline{BC}$. Points $P$ and $Q$ lie on segments $\overline{AB}$ and $\overline{AC}$, respectively, so that $\angle PMB = \angle QMC = \frac{1}{2}\angle BAC$. Given that $AP = 1$, $AQ = 3$, and $BC = 8$, compute $BP$.

7. Let $ABC$ be an isosceles triangle with $AB = AC$. Points $P$ and $Q$ are located inside triangle $ABC$ such that $BP = PQ = QC$. Suppose that $\angle BAP = 20^\circ$, $\angle PAQ = 46^\circ$, and $\angle QAC = 26^\circ$. Compute the measure of $\angle APC$.

8. Let $ABC$ be a triangle with orthocenter $H$. The internal angle bisector of $\angle BAC$ meets the circumcircles of triangles $ABH$, $ACH$, and $ABC$ again at points $P$, $Q$, and $M$, respectively. Suppose that points $A$, $P$, $Q$, and $M$ are distinct and lie on the internal angle bisector of $\angle BAC$ in that order. Given that $AP = 4$, $AQ = 5$, and $BC = 7$, compute $AM$.

9. Let $ABC$ be triangle with incenter $I$ and incircle $\omega$. The circumcircle of triangle $BIC$ intersects $\omega$ at points $E$ and $F$. Suppose that $\Gamma \neq \omega$ is a circle passing through $E$ and $F$ and tangent to lines $AB$ and $AC$. If $AB = 5$, $AC = 7$, and $\Gamma$ has twice the radius of $\omega$, compute $BC$.

10. Let $ABC$ be a triangle with centroid $G$ and circumcenter $O$. Suppose that the orthocenter of triangle $AGO$ lies on line $BC$. Given that $AB = 11$ and $AC = 13$, compute $BC$.