# MAΘ Competition Team Problem Set 15

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**Problem 1.** Determine the equation of the perpendicular bisector of the line segment passing through the points (-2, -5) and (2, 7).

**Problem 2.** If the points A (1, –2), B (2, 3) C (-4,-3) and D form a parallelogram, find one possible coordinate of D.

**Problem 3.** Square ABCD is positioned in the first quadrant with A on the y-axis, B on the x-axis, and C = (13, 8). Compute the area of the square.

**Problem 4.** Let points $A = (0, 0)$, $B = (1, 2)$, $C = (3, 3)$, and $D = (4, 0)$. Quadrilateral $ABCD$ is cut into equal area pieces by a line passing through $A$. This line intersects $\overline{CD}$ at point $(p, q)$. Find (p,q).

**Problem 5.** In the right triangle $\triangle ACE$, we have $AC = 12$, $CE = 16$, and $EA = 20$. Points $B$, $D$, and $F$ are located on $AC$, $CE$, and $EA$, respectively, so that $AB = 3$, $CD = 4$, and $EF = 5$. What is the ratio of the area of $\triangle DBF$ to that of $\triangle ACE$

**Problem 6.** Triangle $ABC$ lies in the cartesian plane and has an area of 70. The coordinates of $B$ and $C$ are $(12, 19)$ and $(23, 20)$, respectively, and the coordinates of $A$ are $(p, q)$. The line containing the median to side $BC$ has slope $-5$. Find the largest possible value of $p + q$.