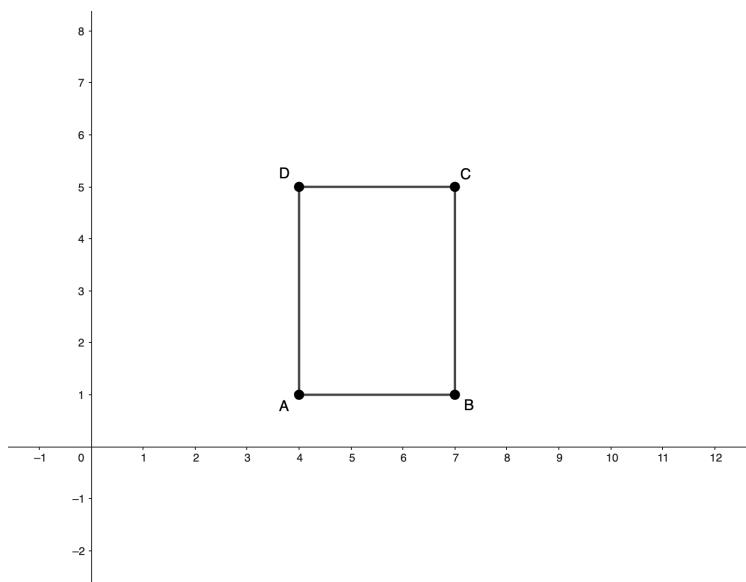


As shown in the figure below, rectangle $ABCD$ has vertices $A(4, 1)$, $B(7, 1)$, $C(7, 5)$, and $D(4, 5)$. Let P be a point outside of $ABCD$. When connecting P to vertices A , B , C , and D with line segments, if the line segments do not pass through the interior of $ABCD$, we call such vertices of $ABCD$: *Visible from P*. Depending on the position of P , the number of visible vertices of $ABCD$ can be two or three. Among the triangles formed by connecting point P with two or three of the visible vertices, if such a triangle lies entirely outside of $ABCD$, then the sum of the areas of those triangles is defined as: *Visible area from P*. Given this information and definitions, answer the questions below.¹

- (1): Find the vertices visible from the origin.
- (2): Find the visible area from $(-1, 2)$.
- (3): Find the visible area from $(-1, 6)$.
- (4): Find all points that have a y-coordinate of 5 and have a visible area of 10.
- (5): Find all points on the y-axis that have a visible area of 10.



¹Ochanomizu Women's University High School, Tokyo