

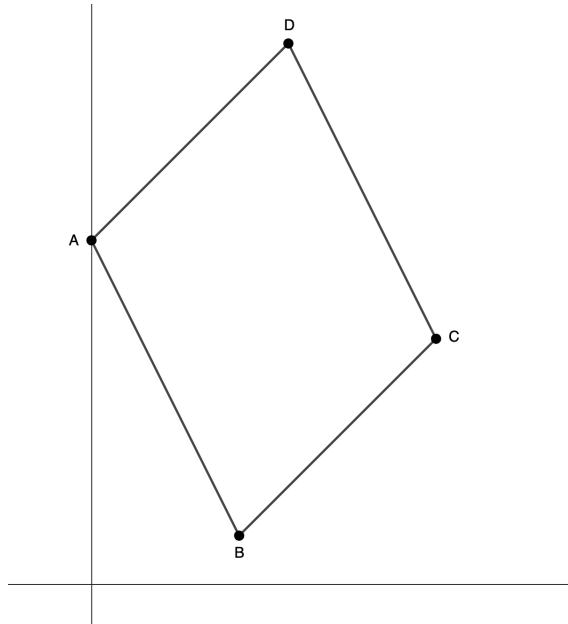
In the figure below,  $ABCD$  is a parallelogram. Coordinates:  $A(0, 7)$ ,  $B(3, 1)$ ,  $C(7, 5)$ .<sup>1</sup>

(1): Find the coordinates of point  $D$ .

(2): Find the equation of the line that passes through points  $A$  and  $C$ .

(3): Find the equation of the line that passes through the origin and splits the area of  $ABCD$  in half.

*Hint: A diagonal of a parallelogram splits its area in half.*



---

<sup>1</sup>Nihon University Buzan High School, Tokyo