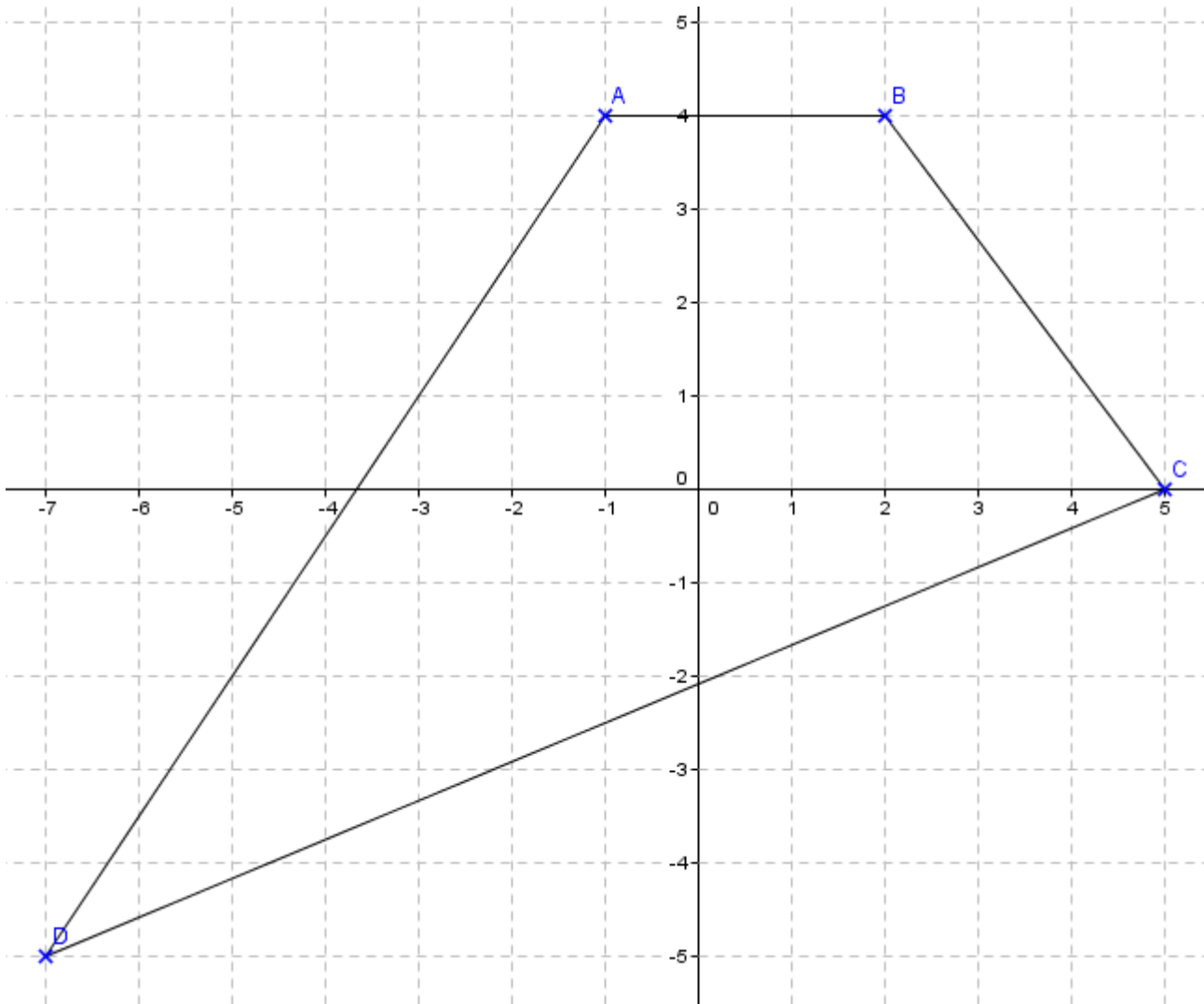


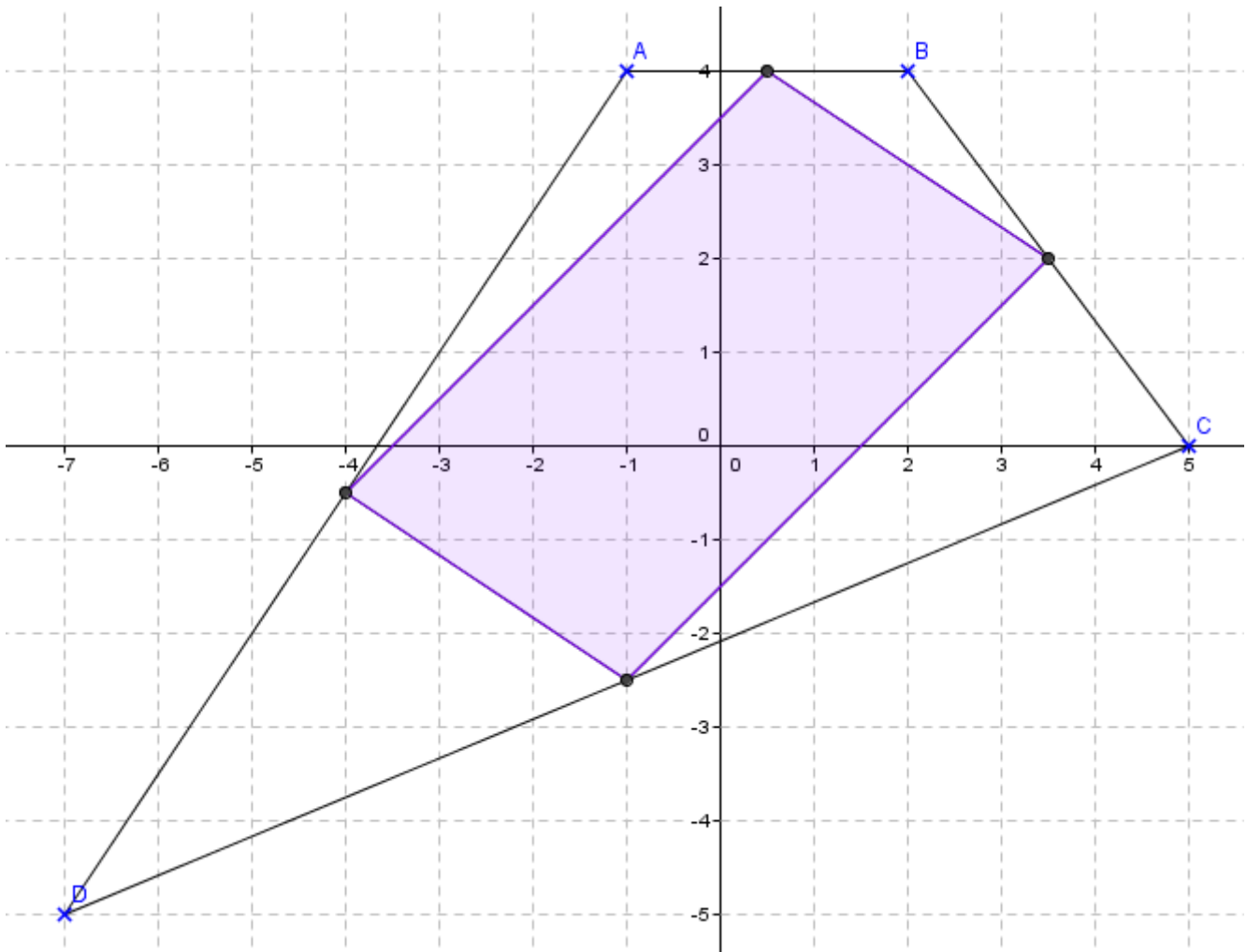
Line Segments



The points A, B, C and D have coordinates $(-1,4)$, $(2,4)$, $(5,0)$ and $(-7,-5)$ respectively.

1. Find the length of each of the line segments AB, BC, CD and DA.
2. Find the midpoint of each of the line segments.
3. Plot the midpoints on the diagram and join them up to form a quadrilateral. What do you notice? Investigate whether this happens every time.

Line Segments SOLUTIONS



The points A, B, C and D have coordinates $(-1, 4)$, $(2, 4)$, $(5, 0)$ and $(-7, -5)$ respectively.

1. Find the length of each of the line segments AB, BC, CD and DA.

AB: 3

BC: 5

CD: 13

DA: $\sqrt{117} \approx 10.8$

2. Find the midpoint of each of the line segments.

AB: $(0.5, 4)$

BC: $(3.5, 2)$

CD: $(-1, -2.5)$

DA: $(-4, -0.5)$

3. Plot the midpoints on the diagram and join them up to form a quadrilateral. What do you notice? Investigate whether this happens every time.

The shape generated is a parallelogram; opposite sides are equal and parallel. Joining the midpoints of the sides of any quadrilateral (even an arrowhead or a self-intersecting quadrilateral) will always form a parallelogram. This can be proved using similar triangles or vectors.