# Vectors and configurations	Season	01
	Episode	14
	Time frame	1 period

Prerequisites : Basic notions about vectors.

Objectives :
- Discover some simple but important configurations involving vectors.
- Practise the vocabulary about geometry.

Materials :
- *Hand-outs with all the configurations and properties.*
- *Properties involving vectors and figures.*

1 – Matching game — 10 mins

Each student is handed out a card with either a property involving vectors or a figure. Students mingle to find who has the right property for their figure and vice-versa.

2 – Writing a property — 15 mins

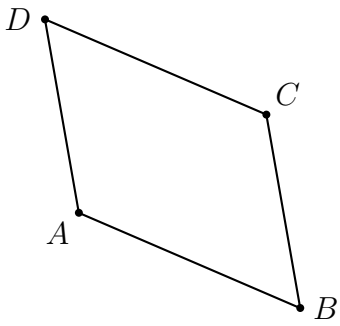
Each pair has to write a precise rule about the property and figure they have. The teacher checks each one of them.

3 – Presentations — 30 mins

Each pair goes to the board to explain their property. A hand-out with all properties is given at the end of the session.

A quadrilateral $ABCD$ is a parallelogram if and only if

$$\overrightarrow{AB} = \overrightarrow{DC}.$$



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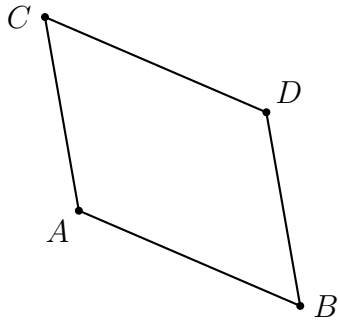
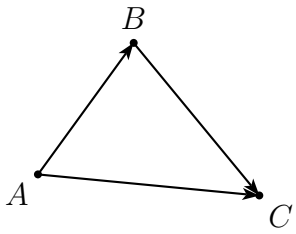


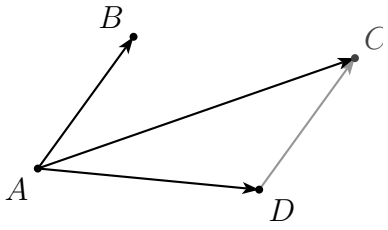
For any three points A, B and C,

$$\overrightarrow{AB} + \overrightarrow{BC} = \overrightarrow{AC}.$$



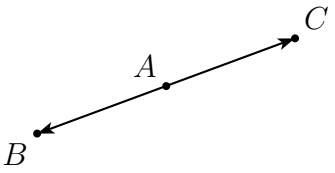
A quadrilateral $ABCD$ is a parallelogram if and only if

$$\overrightarrow{AB} + \overrightarrow{AD} = \overrightarrow{AC}.$$



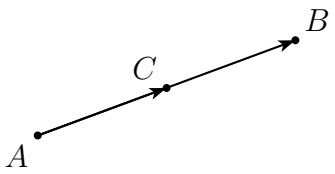
A point A is the midpoint of a segment BC if and only if

$$\overrightarrow{AB} + \overrightarrow{AC} = \vec{0}.$$



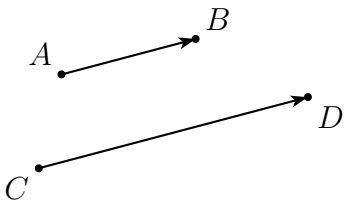
A point C is the midpoint of a segment AB if and only if

$$\overrightarrow{AB} = 2\overrightarrow{AC}.$$



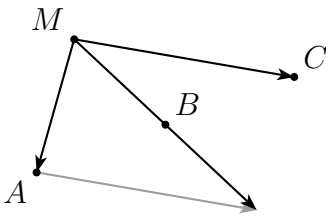
The fact that the lines CD and AB are parallel, that the vectors have the same direction and that $CD = 2AB$ can be written as the equality

$$\overrightarrow{CD} = \overrightarrow{2AB}.$$



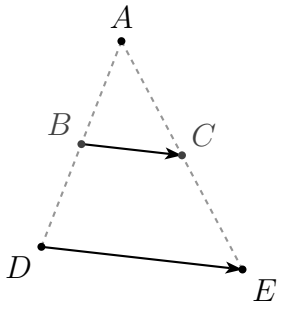
If point B is the midpoint of a segment AC, then for any point M,

$$\overrightarrow{MA} + \overrightarrow{MC} = 2\overrightarrow{MB}.$$



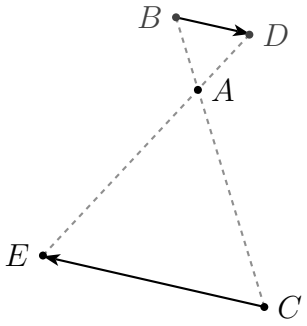
If the points B and C are the midpoints of the legs of a triangle ADE, then

$$\overrightarrow{DE} = 2\overrightarrow{BC}.$$



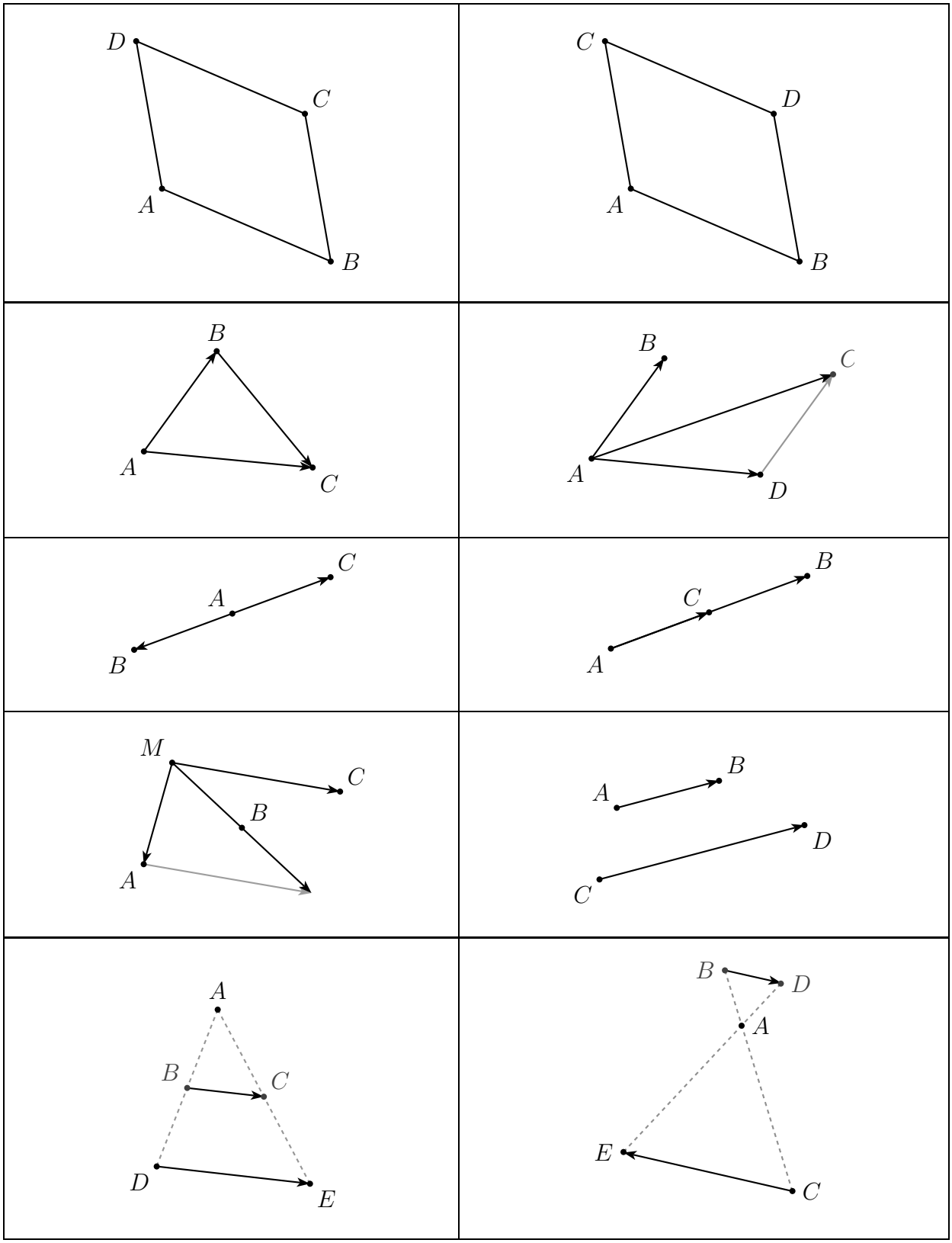
If A is the intersection of two segments BC and DE such that $AB = \frac{1}{3}AC$ and $AD = \frac{1}{3}AE$ then

$$\overrightarrow{BD} = -\frac{1}{3}\overrightarrow{CE}.$$



Document 1 Properties and figures

$\overrightarrow{AB} = \overrightarrow{DC}$	$\overrightarrow{AB} = \overrightarrow{CD}$
$\overrightarrow{AB} + \overrightarrow{BC} = \overrightarrow{AC}$	$\overrightarrow{AB} + \overrightarrow{AD} = \overrightarrow{AC}$
$\overrightarrow{AB} + \overrightarrow{AC} = \vec{0}$	$\overrightarrow{AB} = 2\overrightarrow{AC}$
$\overrightarrow{CD} = 2\overrightarrow{AB}$	$\overrightarrow{MA} + \overrightarrow{MC} = 2\overrightarrow{MB}$
$\overrightarrow{DE} = 2\overrightarrow{BC}$	$\overrightarrow{BD} = -\frac{1}{3}\overrightarrow{CE}$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