Gain attention from a class

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Graph theory

• In graph theory, an **Eulerian trail** is a trail in a finite graph that visits every edge **exactly once** (allowing for revisiting vertices).

• A **graph** is an ordered pair $G = (V, E)$ comprising:
  • $V$, a set of **vertices**;
  • $E \subseteq \{ \{x, y\} \mid x, y \in V \text{ and } x \neq y \}$, a set of **edges**, which are unordered pairs of vertices (that is, an edge is associated with two distinct vertices).
Exercise

• Which of these graphs have an Eulerian trail?
• Find a criterion to decide whether a graph has an Eulerian trail.
A Challenge

• How many of you can draw the little house (also known as the envelope) without lifting the pen and without going over the same line twice?
A Challenge

• How many of you can draw this new figure (still without lifting the pen and without going over the same line twice)?
A Challenge

- And this one (still without lifting the pen and without going over the same line twice)?
A Challenge

• And this one (still without lifting the pen and without going over the same line twice)?
How to engage your audience

Involve
• Material
• Challenges

Run into a problem
• Problem requires a specific answer
• Could the answer be generalised? How?

Go further
• Generalisation
• Opening on new or related challenges
Particularities of school groups

• Captive audience
• Emulation and challenging between classmates
• Homogeneous level of knowledge
• Easy collaboration between classmates
Exercise

• Which of these graphs have a Eulerian trail?