Sharing Math Teaching Ideas

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First-Year Maths and Stats in Canada

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Idea 1: (Re)Discovering Varignon's Theorem

1. To get inspiration, students are prompted on a worksheet to
   - **(a)** "Draw a quadrilateral (i.e. a 4-sided polygon)."
   - **(b)** "Draw another quadrilateral. Try to make it look different from the one you drew in (a)."
2. Further on-screen prompts read:
   - **(c)** "Indicate the midpoints of the 4 sides of your first quadrilateral. Connect them to form another quadrilateral."
   - **(d)** "Do the same for your quadrilateral in (b)."
   - **(e)** "Stare at your creations. Discuss with your peers. Notice anything?"

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(b) Draw another quadrilateral. Try to make it look different from the one you drew in (a).

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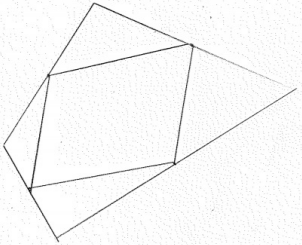
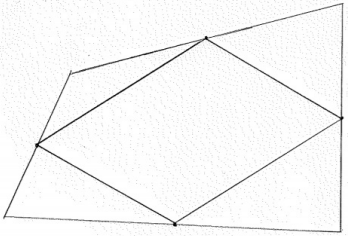


(b) Draw another quadrilateral. Try to make it look different from the one you drew in (a).



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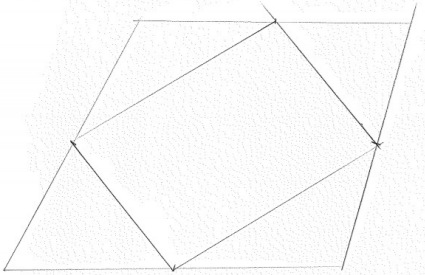
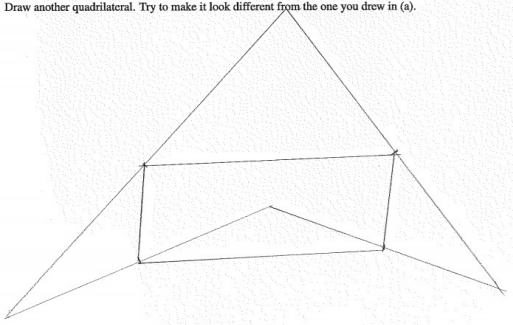


(b) Draw another quadrilateral. Try to make it look different from the one you drew in (a).



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3. Facilitate the crowd to formulate a statement we want to verify, decide on proof strategies, and collectively come up with an argument.
4. Ask follow-up questions:
   - What is the area of the midpoint parallelogram?
   - Does it still work if starting quadrilateral
     - was nonconvex?
     - crossed itself?
     - had 4 vertices that don't lie on the same plane?
   - When is the midpoint parallelogram actually a rhombus? A rectangle? A square?
   - Does this also work for other polygons?

Idea 2: Numerical Integration via Desmos

https://www.desmos.com/calculator/y4iuilm21b

Idea 3: A Meta Idea!

How can we better share our teaching ideas and resources?

- Can we start a newsletter / periodical for this sort of thing (and more)?
- Can we do this in a more interactive way? (E.g. Using the forum in our repository?)