

Similar Triangles With a New Slant

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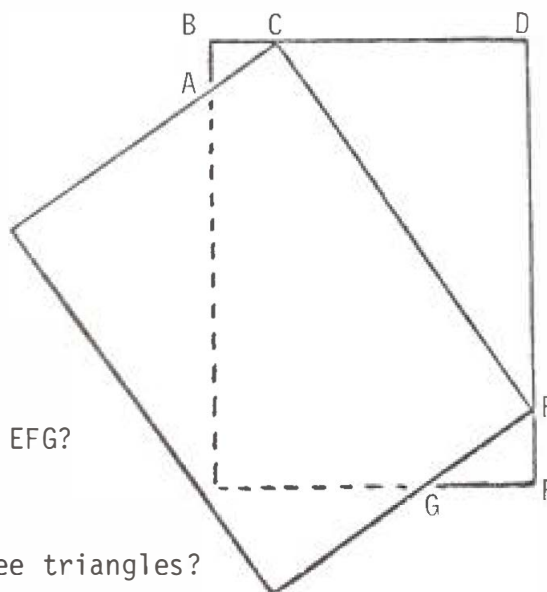
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The following investigation is proposed based on the premise that mathematics teachers are keen to collect ideas and activities that serve to enrich the topics they teach.

Consider two sheets of paper approximately 21 cm by 27 cm. Overlap the two sheets of paper so that the two right-hand corners of the top sheet touch the top and right-hand sides of the bottom sheet as shown in the figure at the right.

The resulting triangles ABC, CDE, and EFG may be the focus of some discussion. The following is a list of some of the features of the diagram that you may wish to investigate further:



1. What kind of triangles are ABC, CDE, and EFG?
2. Prove: $\triangle ABC \sim \triangle CDE \sim \triangle EFG$.
3. Is there a 30-60-90 position for all three triangles?
4. Is there a 45-45-90 position for all three triangles?
5. What happens when B and C coincide?
6. What happens when E and F coincide?
7. At what position is $\overline{AG} \parallel \overline{CE}$?
8. Is there a position for congruent triangles?
9. Are there any new features to the above questions if the two sheets were square?
10. Investigate the possibility of there being a constant ratio between the perimeters or the areas of the triangles.

The above are just a sample of possible questions that could be asked about this situation. Perhaps you can come up with some others.