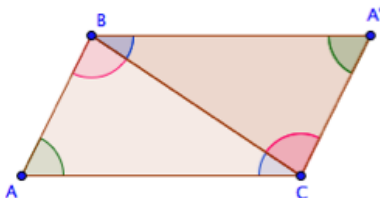


5.4 Parallelism Preserved and Protected

A Develop Understanding Task

Explain how you know that this figure, which was formed by rotating a triangle about the midpoint of one of its sides, is a parallelogram.



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Knowing that lines or line segments in a diagram are parallel is often a good place from which to start a chain of reasoning. Almost all descriptions of geometry include a *parallel postulate* among the list of statements that are accepted as true. In this task we develop some parallel postulates for rigid motion transformations.

Translations

Under what conditions are the corresponding line segments in an image and its pre-image parallel after a translation? That is, which word best completes this statement?

After a translation, corresponding line segments in an image and its pre-image are [never, sometimes, always] parallel.

Give reasons for your answer. If you choose “sometimes”, be very clear in your explanation how to tell when the corresponding line segments before and after the translation are parallel and when they are not.



Rotations

Under what conditions are the corresponding line segments in an image and its pre-image parallel after a rotation? That is, which word best completes this statement?

After a rotation, corresponding line segments in an image and its pre-image are [never, sometimes, always] parallel.

Give reasons for your answer. If you choose “sometimes”, be very clear in your explanation how to tell when the corresponding line segments before and after the rotation are parallel and when they are not.

Reflections

Under what conditions are the corresponding line segments in an image and its pre-image parallel after a reflection? That is, which word best completes this statement?

After a reflection, corresponding line segments in an image and its pre-image are [never, sometimes, always] parallel.

Give reasons for your answer. If you choose “sometimes” be very clear in your explanation how to tell when the corresponding line segments before and after the reflection are parallel and when they are not.

