.0ɸMProperties of Dilations

Mark the following statements as True or False. Provide a justification for your answer.

1. In a dilation $D_{k, C,}$the center point C is the only point that maps to itself.

2. If point B is between points A and C, then in a dilation, the image of B, B' will be between A' and C'.

3. In a dilation $D_{k, C,}$, any line through C will map to a parallel line.

4. In a dilation $D_{k, C,}$, the image of a triangle is always a triangle.

5. In a dilation $D_{k, C,}$, the image of a triangle is never congruent to the original triangle.

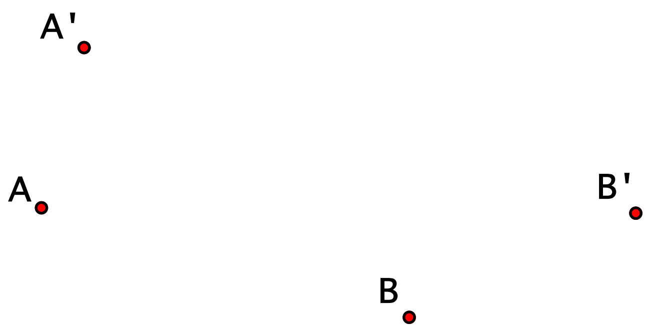
6. In a dilation $D_{k, C,}$, the image of an angle <ABC will be an angle k times as large.

7. In a dilation $D_{k, C,}$, the ratio of the lengths of two segments is equal to the ratio of the lengths of the image segments.

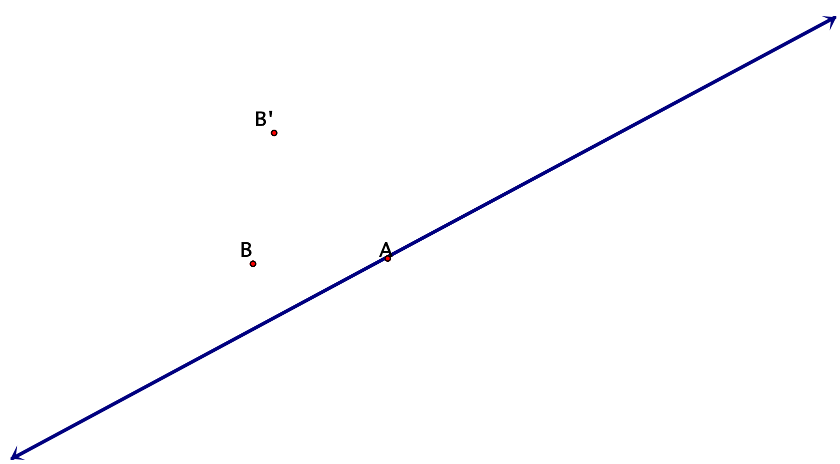
8. Given a parallelogram AA'BB', there is no dilation that maps A to A' and B to B'.

Short Answer

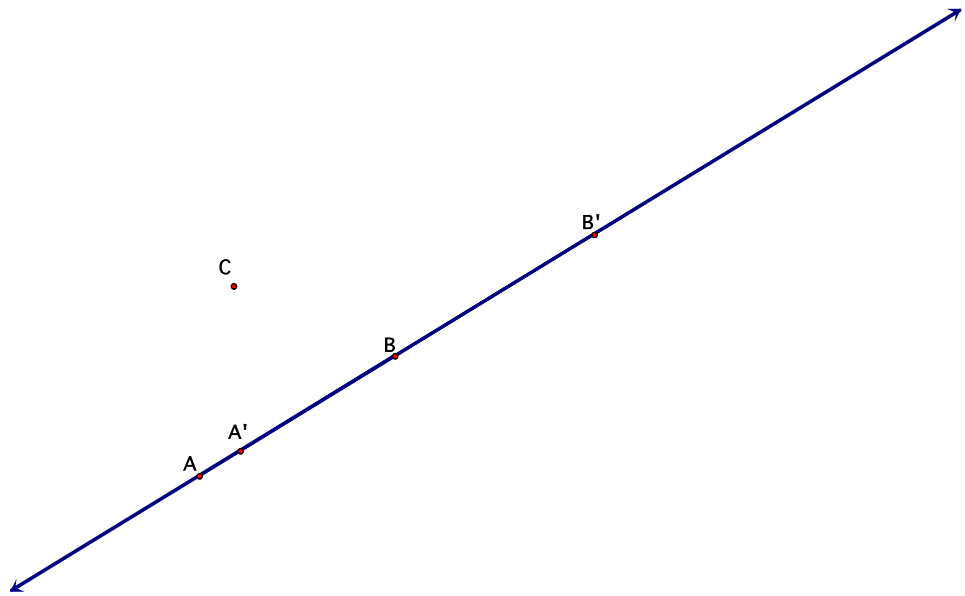
1. Explain how to find the center of a dilation that maps A to A’ and B to B’.



2. Given that a dilation that maps B to B’ has its center on line *m,* describe how to construct the image point A’ for that dilation.



3. Given a dilation that maps A to A’ and B to B’, construct the image of point C for this dilation. Explain the steps used and why they work.



4. Consider the set of all dilations centered at one point C. Is this set closed? That is, if one combines two dilations, one followed by the other, do you get another dilation centered at C?

5. What dilation acts as an identity for the set of dilations all centered at C?

6. What dilation acts as an inverse for $D_{k, C,}$? Explain why your choice works.

7. Is the set of dilations centered at C commutative? That is, if you construct $D_{k, C,}$ followed by $D_{m,C}$ do you get the result as when you construct $D_{m,C}$ followed by $D_{k, C}$?

8. Is the set of dilations centered at C associative? Write out what that would mean, then investigate.