Lesson 7: Informal Proofs of Properties of Dilation

Classwork

Exercise

Use the diagram below to prove the theorem: *Dilations preserve the measures of angles.*

Let there be a dilation from center with scale factor . Given show that since , , and , then . That is, show that the image of the angle after a dilation has the same measure, in degrees, as the original.

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Problem Set

1. A dilation from center by scale factor of a line maps to what? Verify your claim on the coordinate plane.
2. A dilation from center by scale factor of a segment maps to what? Verify your claim on the coordinate plane.
3. A dilation from center by scale factor of a ray maps to what? Verify your claim on the coordinate plane.
4. Challenge Problem:

Prove the theorem: *A dilation maps lines to lines.*

Let there be a dilation from center with scale factor so that and . Show that line maps to line (i.e., that dilations map lines to lines). Draw a diagram, and then write your informal proof of the theorem. (Hint: This proof is a lot like the proof for segments. This time, let be a point on line , that is not between points and .)