

Given $f: A \rightarrow B$ and $g: B \rightarrow C$ are isometries

$g \circ f: A \rightarrow C$ is a function

Let $a, a', a'' \in A$

$$m(\angle g \circ f(a') g \circ f(a) g \circ f(a''))$$
$$= m(\angle g(f(a')) g(f(a)) g(f(a'')))$$

rename $f(a') = b'$, $f(a) = b$, $f(a'') = b'' \in B$

$$= m(\angle g(b') g(b) g(b''))$$

We know g is an isometry, so

$$m(\angle g(b') g(b) g(b'')) =$$

$$m(\angle b' b b'') =$$

$$m(\angle f(a') f(a) f(a''))$$

$$= m(\angle a' a a'')$$

because f is an isometry

$$\text{So } m(\angle g \circ f(a') g \circ f(a) g \circ f(a'')) =$$

$$m(\angle a' a a'')$$

so $g \circ f$ preserves angle measure

change
names
back