Subject: Re: CALCULATION OF AREA ON A SPHERE
Posted by Tim Cross on Thu, 24 Feb 2000 08:00:00 GMT
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Med Bennett wrote:
>
> Great circles on the sphere are the analogs of straight lines in the
> plane. Such curves are often called geodesics. A spherical triangle is a
> region of the sphere bounded by three arcs of geodesics.
>
>   1.Do any two distinct points on the sphere determine a unique geodesic?

Yes. Years ago, I could prove it.

> Do two distinct geodesics intersect in at most one point?

Fuzzy language, but they intersect at zero points, one point,
or along some geodesic that is a subset of both. Years ago, ...

>   2.Do any three `non-collinear' points on the sphere determine a unique
> triangle?

Two unique triangles - the obvious one that covers < half the sphere,
and the slightly less obvious one that covers the rest of the sphere.
Two unique triangles - it that English?

> Does the sum of the angles of a spherical triangle always equal
> pi? Well, no. What values can the sum of the angles take on?

The small degenerate spherical triangle is a single point, and as
the area of the triangle approaches zero, the sum of the angles
approaches pi, i.e., things get more planar, and more like, say,
a football field cut diagonally, and less like, say, the state
of Colorado cut diagonally. The large degenerate spherical triangle
is everything but the point, and as the area of the triangle
approaches 4pi*r^2 (the area of the sphere), the three angles
approach 2pi, for a total of 6pi.

Do I have a formula for calculating the area of a spherical
triangle? Not offhand. And I've got a job I should probably
get back to... :-)

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My opinions, etc.