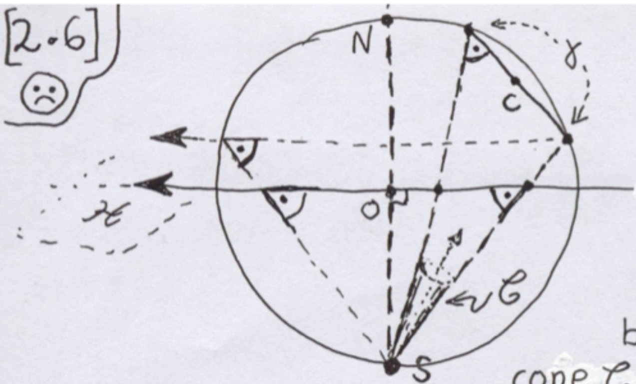
**[2·6]** ☹



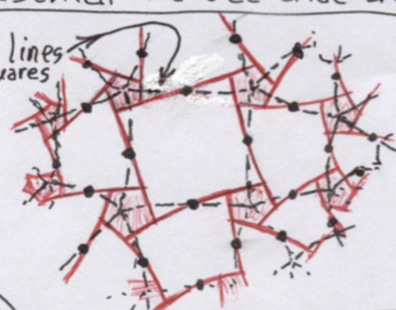

Take the plane through the vertical diameter SN and the centre C of some chosen circle $\gamma$ on the sphere.

The angles marked are all equal (the lines with ← being parallel), so the (elliptical) cone $\mathcal{C}$ joining S to $\gamma$ is intersected by two planes (namely the plane of $\gamma$) and the horizontal equatorial plane $\mathcal{H}$) at opposite slopes to the symmetry axis of the cone (marked with arrow ↗). Hence, these intersections are similar (the elliptical cone being symmetrical under reflection in the axis ↗), so $\gamma$ being a circle is equivalent to the cone $\mathcal{C}$'s intersection with $\mathcal{H}$ being a circle (the limiting case, when $\gamma$ passes through S giving a straight line in the plane). Thus, stereographic projection sends circles to circles, and if we allow our circles to become infinitesimal we see that the map is conformal (Fig. 8·4).

**[2·7]** ☹

See Fig. 2·19a; black broken lines give original squares modify thus: red lines

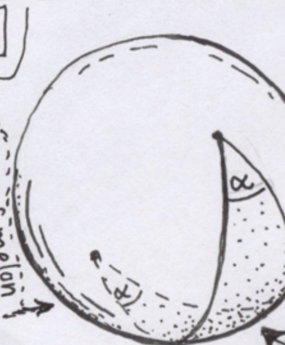
(I'm not sure what this is good for!)



Rotate each line of original square of Fig. 2·19a through the same angle, about centre of side of square (marked point) to get new (red) square.

**[2·8]** ☹

Area of melon skin is $\frac{\alpha}{2\pi}$ of the total




This area is $\frac{\alpha}{2\pi}\times 4\pi R^2 = 2\alpha R^2$

redraw

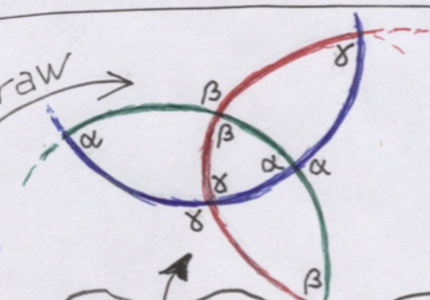




Fig. 2·20

Area is one-half the total sphere area $4\pi R^2$ (since the remainder is also the same shape and size. Let the area of the triangle in the middle be $\Delta$.

From ↗ and we have

$$2\alpha R^2 + 2\beta R^2 + 2\gamma R^2 = 2\pi R^2 + 2\Delta$$

since triply counted ∴ 2 extra $\Delta$s

$$\therefore \Delta = (\alpha+\beta+\gamma-\pi)R^2$$