Meusnier's theorem

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Defines	inclined section

Let P be a point of a surface $F(x,\,y,\,z) = 0$ where F is twice continuously differentiable in a neighbourhood of P. Set at P a tangent of the surface. At the point P, set through this tangent both the normal plane and a skew plane `http://planetmath.org/AngleBetweenTwoPlanes`forming the angle ω with the normal plane. Let ϱ be the radius of curvature of the normal section and ϱ_ω the radius of curvature of the *inclined section*.

Meusnier proved in 1779 that the equation

$$\varrho_\omega = \varrho\cos\omega$$

between these radii of curvature is valid.

One can obtain an illustrative interpretation for the Meusnier's theorem, if one thinks the sphere with radius the radius ϱ of curvature of the normal section and with centre the corresponding centre of curvature. Then the equation utters that the circle, which is intersected from the sphere by the inclined plane, is the circle of curvature of the intersection curve of this plane and the surface $F(x,\,y,\,z) = 0$.