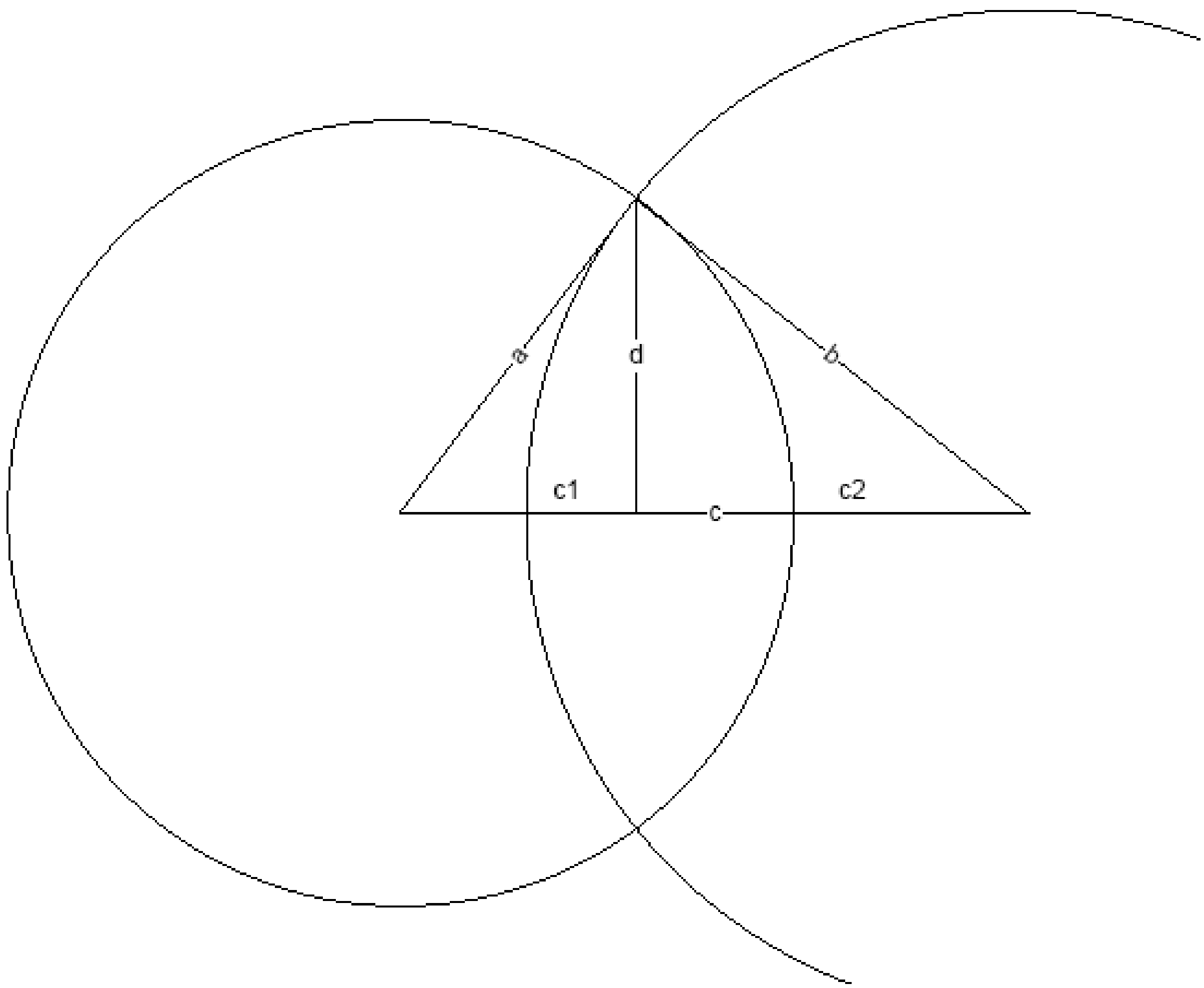
Stereographic Projection Stuff

Intersecting Spheres



Let A and B be two balls with radii a and b. c is the distance between the centers. If $a+b<c$, the balls are disjoint. If $a-b>c$, the first ball contains the second. If $b-a>c$, the second ball contains the first. In any of these cases, the spheres do not intersect.

In[4]:= **Solve**[{$c1^2 + d^2 == a^2$, $c2^2 + d^2 == b^2$, $c1 + c2 == c$}, {c1, c2, d}]

Out[4]= $\left\{\left\{c1 \to \frac{a^2 - b^2 + c^2}{2\,c},\ c2 \to \frac{-a^2 + b^2 + c^2}{2\,c},\ d \to -\frac{\sqrt{-a^4 + 2\,a^2\,b^2 - b^4 + 2\,a^2\,c^2 + 2\,b^2\,c^2 - c^4}}{2\,c}\right\},\right.$
$\left.\left\{c1 \to \frac{a^2 - b^2 + c^2}{2\,c},\ c2 \to \frac{-a^2 + b^2 + c^2}{2\,c},\ d \to \frac{\sqrt{-a^4 + 2\,a^2\,b^2 - b^4 + 2\,a^2\,c^2 + 2\,b^2\,c^2 - c^4}}{2\,c}\right\}\right\}$

If the spheres intersect, clipping by the sphere is equivalent to clipping by a plane. Let c1 be measured to the right of A's center and c2 be measured to the left of B's center. Then c1 and c2 may be positive, zero, or negative. c is positive (we assume it is non-zero).