An arbitrary point P on a torus (not lying in the xy-plane) can have four circles drawn through it. The first circle is in the plane of the torus and the second is perpendicular to it. The third and fourth circles are called Villarceau circles (see [3, 1]).

For more details see [2] for example.

References

[1] Coxeter, H. S. M. *Introduction to Geometry*, 2nd ed. New York: Wiley, pp. 132-133, 1969.

[2] Geometry Center. *The Torus*, http://www.geom.umn.edu/zoo/toptype/torus/.

[3] Schmidt, H. *Die Inversion und ihre Anwendungen*, Munich, Germany: Oldenbourg, p. 82, 1950.