AG**1**: Solve in R^2 system of two quadratic equations with two unknowns:

$$x^2 + 0.25y^2 = 1; \quad 0.25x^2 + y^2 = 1$$

$\left[\pm\frac{\sqrt{5}}{5}, \frac{\sqrt{5}}{5}\right], \left[\pm\frac{\sqrt{5}}{5}, -\frac{\sqrt{5}}{5}\right]$

AG**2**: Solve in R^2 system of two quadratic equations with two unknowns:

$$x^2 + xy + y^2 = 9; \quad x^2 + xy - y^2 = 1$$

$\left[-1 \pm \sqrt{6}, 2\right], \left[1 \pm \sqrt{6}, -2\right]$

AG**3**: Solve in R^2 system of two quadratic equations with two unknowns:

$$x^2 + y = 2; \quad 2x^2 + 2x + y = 1$$

[-1, 1]

AG**4**: Curves are determined by implicit and parametric equations. Determine the intersection points to two decimal places of precision.

$$x^2 + y = 2; \quad X(t) = \left[2 \cdot \cos(t), 2 \cdot \sin(t)\right]$$

T = [0,2] C_{12} = $[\pm\sqrt{3}, -1]$

AG**5**: Conics are determined by implicit and parametric equations. Determine the intersection points to two decimal places of precision.

$$xy = 1; \quad X(t) = \left[\cosh(t), \sinh(t)\right]$$

[1.27;0.79]

AG**6**: Determine foci and vertices of conic $xy + x = 1$ to two decimal points of precision.

A=[1,0]; B=[-1,-2], $F_{1,2} = [\pm\sqrt{2}, \pm\sqrt{2} - 1]$

AG**7**: Determine the intersection points o ellipse $X(t) = \left[5\cos(t), \sqrt{5}\sin(t)\right]$ and straight line AB, where A = [-2,0], B = [0,1].

[-4.29, -1.15], [2.07,2.04]

AG**8**: Write the parametric equations of ellipse with center C = (2,3) semi-major axis *a* =5 and linear eccentricity *e* = 4.

$\left[5\cos t + 2, 3\sin t + 3\right]$

Tangent line to a conic is a line that touches the conic at exactly one point, never entering the conic's interior. Roughly speaking, it is a line through a pair of infinitely close points on the conic.

AG**9**: Determine the tangent line of hyperbola $X(t) = \left[\cosh(t), \sinh(t)\right]$ from an exterior point M = (0, 1).

$\pm y = \mp\sqrt{2} + 1$

AG10: Determine the tangent line of a circle $X(t) = \left[\cos(t), \sin(t)\right]$ from a given point M = (1, 1).

y = 1, x = 1