F. Winkler   solve by 27 April 2010

Commutative Algebra & Algebraic Geometry
SS 2010

(15) Exhibit a field K such that $\mathbb{A}^2(K)$ is reducible.

(16) Let I be the radical of the ideal generated by

$$f_1 = x^2 + 2x + y, \quad f_2 = xy - x \ .$$

Determine whether
$$h_1 = x + y, \quad h_2 = x - y$$

are in I.

(17) Show the existence of polynomials f_i in the proof of Theorem 4.2.6.

(18) Consider a squarefree polynomial $f(x, y) \in \mathbb{C}[x, y]$.
    (a) Is $V(f, \partial f / \partial x)$ finite?
    (b) Is $V(f, \partial f / \partial x, \partial f / \partial y)$ finite?