The moment problem for two-dimensional semialgebraic sets

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Let h be a polynomial in n variables, and let $S = \{x \in \mathbb{R}^n : h(x) \geq 0\}$. The moment problem for the set S roughly translates into the question whether every polynomial that is positive on S can be approximated by polynomials of the form $s + th$ where s and t are sums of squares of polynomials. We discuss various techniques to approach this problem, in particular in the case $n = 2$.