Last name _____

First name _____

LARSON—MATH 591—CLASSROOM WORKSHEET 13
Radical Ideals

An ideal I in $k[x_1, \ldots, x_n]$ is **radical** if $f^m \in I$ (for *some* positive integer m) implies that $f \in I$.

We will show that $\langle x, y \rangle$ is a radical ideal in $\mathbb{R}[x, y]$.

1. Let $f \in \mathbb{R}[x, y]$ and suppose that $f^m \in \langle x, y \rangle$ for some positive integer m. What form must f^m have?

2. Suppose $f \notin \langle x, y \rangle$. What does this mean? What form must f have?

3. Then what form must f^m have? How does this contradict one of our assumptions?