

Math 525 — Quiz 10 – October 23, 2023

Name: _____

Consider the polynomial ring $\mathbb{R}[x]$ and the map $\phi: \mathbb{R}[x] \rightarrow \mathbb{R}[x]$ defined by $\phi(f) = f(x^2)$.

1. Find $\phi(f)$, where $f = 2 - 3x + x^2 \in \mathbb{R}[x]$.
2. Is ϕ a ring homomorphism? Why or why not?
3. Considering $\mathbb{R}[x]$ as a module over itself, is ϕ a homomorphism of $\mathbb{R}[x]$ -modules? Why or why not?