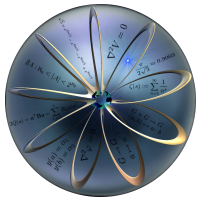

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translation automorphism of a polynomial ring

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Let R be a commutative ring, let $R[X]$ be the polynomial ring over R, and let a be an element of R. Then we can define a homomorphism τ_a of $R[X]$ by constructing the evaluation homomorphism from $R[X]$ to $R[X]$ taking $r \in R$ to itself and taking X to $X + a$.

To see that τ_a is an automorphism, observe that $\tau_{-a} \circ \tau_a$ is the identity on $R \subset R[X]$ and takes X to X, so by the uniqueness of the evaluation homomorphism, $\tau_{-a} \circ \tau_a$ is the identity.