

The ϕ -derivations

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Abstract

We generalize the d erivations with help of homomorphisms

1 The derivations

Let be given an algebra A , a derivation is an application such that:

$$X(ab) = X(a)b + aX(b)$$

2 The ϕ -derivations

Let be given an algebra A with an homomorphism ϕ , a ϕ -derivation is an application such that:

$$X(ab) = X(a)\phi(b) + \phi(a)X(b)$$

3 Properties

The definition makes sense because $X(ab.c) = X(a.bc)$ (ϕ is an homomorphism). If ϕ is an isomorphism, the ϕ -derivations are reduced to derivations. It is a vector space but we have no Lie brackets.

4 Bibliography

N.Jacobson, "Basic Algebra", I-II, Dover, US, 2017.