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Comparison and inversion of planar ternary rings with zero. (English) Zbl 0534.16033
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In this paper the properties of comparative and inverse of a planar ternary ring with zero (PTRZ) are studied. Let $(S, \langle \rangle)$ be a PTRZ and $s \in S$. Then $(S, \langle \rangle_s)$ is called the comparative of $(S, \langle \rangle)$ with respect to s if $\langle a, s + m, b \rangle = \langle a, s, \langle a, m, b \rangle_s \rangle$ and $(S, \langle \rangle^i)$ is called the inverse of $(S, \langle \rangle)$ if $m \neq 0$, $\langle b, m, d \rangle = 0 \Rightarrow \langle \langle a, m, b \rangle^i, m, d \rangle = a$. It is proved that (i) the comparative (inverse) of a PTRZ is a PTRZ, (ii) the comparative of a generalized Cartesian group is a generalized Cartesian group, (iii) the projective planes induced by a PTRZ and its comparative (inverse) are isomorphic (iv) $\langle \rangle = \langle \rangle_{s, -s}$ and (v) $\langle \rangle = \langle \rangle^{i, i}$.

MSC:

[16Y60](#) Semirings
[17A40](#) Ternary compositions
[51E15](#) Finite affine and projective planes (geometric aspects)

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- [2] L. A. Skornyakov, Natural domains of Veblen-Wedderburn projective planes. Russ. Izv. Nauk, SSSR., Ser. Mat. 13, 447-472 (1949); Amer. Math. Soc. 58 (1951). · [Zbl 0033.12502](#)

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