Nowak, Marian
Some equalities among Orlicz spaces. II. (English) $\boxed{\text{Zbl 0639.46033}}$
Bull. Pol. Acad. Sci., Math. 34, 675-687 (1986).

The paper is a continuation of the author's paper Ann. Soc. Math. Pol. Ser. I, Comment. Math (to appear), where some equalities among Orlicz spaces defined by arbitrary Orlicz functions are proved. Here we present some equalities among Orlicz spaces defined by convex Orlicz functions. Let L^ϕ and E^ϕ denote the Orlicz space and the space of finite elements resp., defined by ϕ on an arbitrary measure space. Let Φ_1^c be the set of all convex Orlicz functions ϕ taking only finite values and such that $\phi(u)/u \to 0$ as $u \to 0$, and let Φ_2^c be the set of all convex functions ϕ vanishing only at zero and such that $\phi(u)/u \to \infty$ as $u \to \infty$. In this paper for each $\phi_1 \in \Phi_1^c$ and $\phi_2 \in \Phi_2^c$ we find the sets of N-functions $\Psi_1^{\phi_1}$ and $\Psi_2^{\phi_2}$ respectively such that

$$E^{\phi_1} = \cup_{\psi \in \Psi_1^{\phi_1}} E^\psi = \cup_{\psi \in \Psi_1^{\phi_1}} L^\psi \quad and \quad L^{\phi_2} = \cap_{\psi \in \Psi_2^{\phi_2}} L^\psi = \cap_{\psi \in \Psi_2^{\phi_2}} E^\psi.$$

Moreover, we show that if $\phi_1 \in \Phi_1^c$ and $\phi_2 \in \Phi_2^c$ are mutually complementary, then the sets $\Psi_1^{\phi_2}$ and $\Psi_2^{\phi_2}$ are mutually related in such a way that: $(\Psi_1^{\phi_1})^* = \{\psi^* : \psi \in \Psi_1^{\phi_1}\} = \Psi_2^{\phi_2}$ and $(\Psi_2^{\phi_2})^* = \Psi_1^{\phi_1}$ (ψ^* is the function complementary to ψ in the sense of Young). These equalities are generalizations of some partial results obtained by *R. R. Welland* [Proc. Am. Math. Soc. 17, 135-139 (1966; Zbl 0137.098)] and the author [Funct. Approximatio, Comment Math. 10, 83-91 (1980; Zbl 0475.46025)].

Reviewer: M.Novak

MSC:

46E30	Spaces of measurable functions (L^p-spaces, Orlicz spaces, Köthe function spaces, Lorentz spaces, rearrangement invariant spaces, ideal spaces, etc.)

Cited in **1** Review
Cited in **2** Documents

Keywords:

equalities among Orlicz spaces; convex Orlicz functions