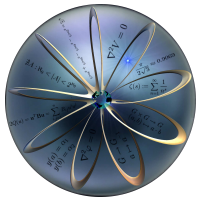

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perfect code

Canonical name	PerfectCode
Date of creation	2013-03-22 14:23:43
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Numerical id	5
Author	mathcam (2727)
Entry type	Definition
Classification	msc 11T71
Defines	packing radius
Defines	covering radius

Let C be a http://planetmath.org/LinearCodelinear (n, k, d)-code over $\mathbb{F}_q$.

The *packing radius* of C is defined to be the value

$$\rho(C) = \frac{d-1}{2}.$$

The *covering radius* of C is

$$r(C) = \max_x \min_c \delta(x, c)$$

with $x \in \mathbb{F}_q^n$ and $c \in C$, and where δ denotes the Hamming distance on $\mathbb{F}_q^n$.

The http://planetmath.org/Codecode C is said to be *perfect* if $r(C) = \rho(C)$.

The list of of linear perfect codes is very short, including only trivial codes, Hamming codes (i.e. $\rho = 1$), and the binary and ternary http://planetmath.org/BinaryGo codes.