

D Cayley digraph. For all $k \geq 1$ and all $v \in V(D)$ we have $|R_k^+(v)| = |R_k^-(v)|$.

Quasi-isometry

X, Y graphs $C \geq 0, \alpha \geq 1$

$f: X \rightarrow Y$

f is (α, C) -quasi-isometry if

$$1. \frac{1}{\alpha} d_X(x_1, x_2) - C \leq d_Y(f(x_1), f(x_2)) \leq \alpha d_X(x_1, x_2) + C$$

2. C -neighborhood of $f(X)$ is Y

Woess (1991)

Is every connected locally finite vertex transitive graph quasi-isometric to some Cayley graph?