

SMALL CANCELATION: EXERCISE SHEET 5

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- (1) Prove that a finitely presented group has decidable word problem if and only if it has a computable isoperimetric function.
- (2) Note that the definitions of isoperimetric function and Dehn function also apply to generate finite 2-complexes. Show that if $\pi_1(X) \cong \pi_1(Y)$ for finite 2-complexes X and Y then X and Y have equivalent isoperimetric and Dehn functions. Hint: If T is a spanning tree of X^1 then the quotient X/T identifying all points of T is typically (when?) a group presentation. Consider what happens to Dehn and isoperimetric functions when contracting a single edge of a 2-complex.