Theorems… unproved mostly?

Theorem 1: (proof?)

Given, Object O and its boundary dO. Rotational Sweep volume R(O) and its boundary dR(O). Then,

dR(O) is a subset R(dO).

In short, we only need to consider the rotating boundaries. Then we trim useless stuff.

Proof: Assume a point in dR(O) not from dO and is from a point x inside the object. As x is surrounded by inf many points in all dir. So will a point in dR(O). => contradicts w/ assumption that this is boundary.

Theorem 2:

for G1 dO’s convex arcs…

for G1 dO’s concave arcs…

Theorem 3:

A point in R(O) corresponds to many points in O.

There is many-to-many correspondence between points in O and R(O).

Let R(p) = set of points resulting from sweep of p.

Let R^-1(q) = L(q) = set of points p that can become q (in R(O)) by rotating p with an arbitrary angle inside [0, rotation\_angle].

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Theorem 4:

the boundary’s superset consists of 2 arcs.

1. rotated arcs from original model

2. arcs with circle center = origin.

For a point p let p+ denote a point, which is formed by rotation p with angle theta, which is theta>0 and theta< a for arbitrary a > 0. p- is opposite.

I. prove T or F) if p+, p- both not inside object. Type2 Arc should be formed

=> each R^-1 …

II. prove TF) if one of p+ p-, exists, Type 2 arc is not needed.