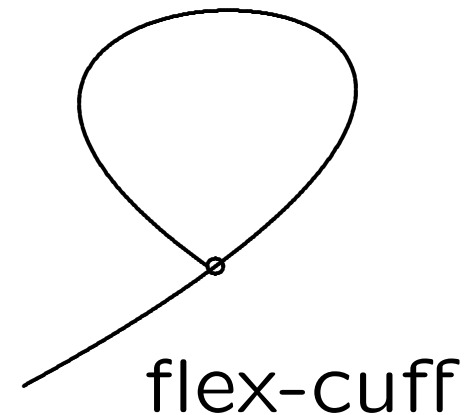
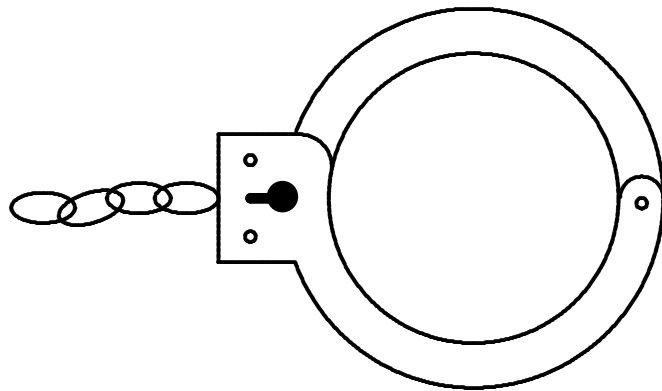


To hold a convex body by a frame

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- Is it possible to hold a cube by a circular handcuff?
- How about for other convex bodies?
- By a flex-cuff or handcuffs of other shapes?



- A **frame** is the (rigid) boundary curve of a convex disk in a plane.
- A frame F is said to **hold** a convex body K if
 - (1) F is **attached** to K , that is,
$$F \cap \text{int}(K) = \emptyset, \text{conv}(F) \cap \text{int}(K) \neq \emptyset, \text{ and}$$
 - (2) F cannot **slip out** of K by a rigid motion with keeping $F \cap \text{int}(K) = \emptyset$.

1. Circular frame

A convex body is called **circle-free** if no **circle** can hold it.

- Every ball is circle-free.
- A cube and a regular tetrahedron are not circle-free.

