

## Part III

# Mapping of Contacting Part Surfaces

In engineering applications, it is often desired to design a pair of interacting part surfaces so, as to optimize the conditions of interaction between the two smooth regular part surfaces.

The conditions of interaction between two smooth regular part surfaces in contact can be specified in terms of:

- (a) contact stress,
- (b) conditions of lubrication, including but not limited to elastic-hydrodynamic (*EHD*) lubrication,
- (c) rolling/sliding conditions, and so forth.

Contact geometry of surfaces significantly influences the performance of the interacting part surfaces. This means that two part surfaces, which are featuring a certain contact geometry, demonstrate more favorable contact strength, lower surface wear, as well as others parameters that indicate high performance of the interacting part surfaces. In other words, for a given part surface, there exists a corresponding part surface geometry that ensures the highest possible bearing capacity of these two part surfaces in contact. It is of practical importance to determine a part surface that is corresponding to a given part surface, both of which in contact feature the most favorable performance. Engineering problems of this kind can be solved by means of mapping of one surface (of a given part surface) onto another surface (onto the part surface to be determined). Several useful kinds of surface mapping are considered in this section of the monograph.

Part III of the book is comprised of three chapters.

Chapter 8 is titled “ $\mathbb{R}$ -Mapping of Interacting Part Surfaces.”

Chapter 9 is titled “Generation of Enveloping Surfaces: General Consideration.”

Chapter 10 is titled “Generation of Enveloping Surfaces: Special Cases.”