

The background is a dark blue field filled with various colorful geometric shapes, including circles, ovals, and elongated rectangles in shades of teal, green, orange, and purple. These shapes are arranged in a dynamic, overlapping pattern that creates a sense of movement and depth. A thin white rectangular border frames the text area on the left side of the image.

INTRODUCTION TO GEARS

MET 4501

LEAH GINSBERG, PH.D.

TYPES OF GEARS

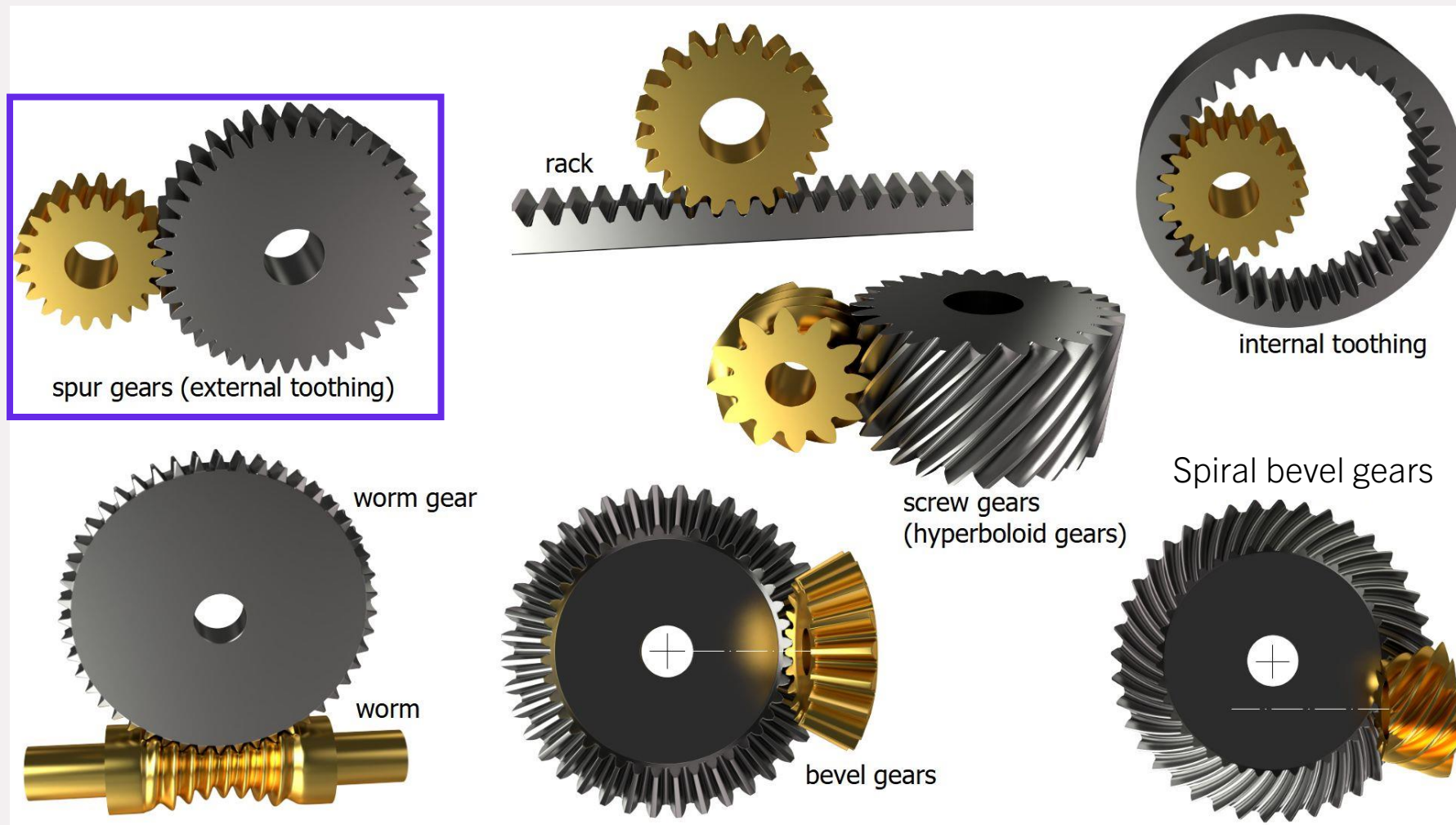
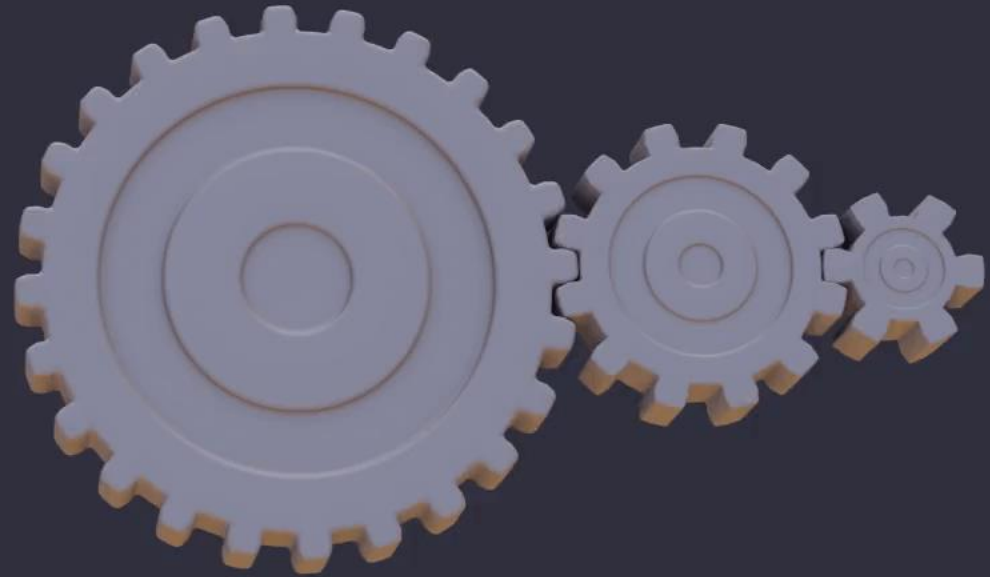


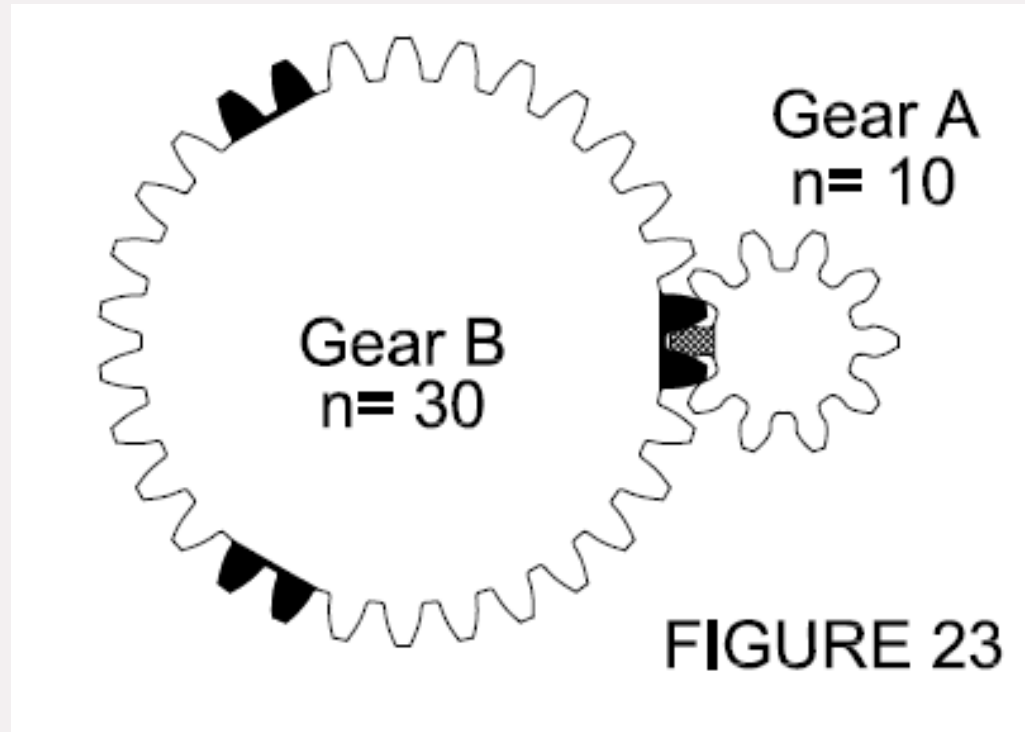
Image source: <https://www.tec-science.com/category/mechanical-power-transmission/gear-types/>

GEARS IN MOTION



PRIME GEAR SETS

Not prime



Prime

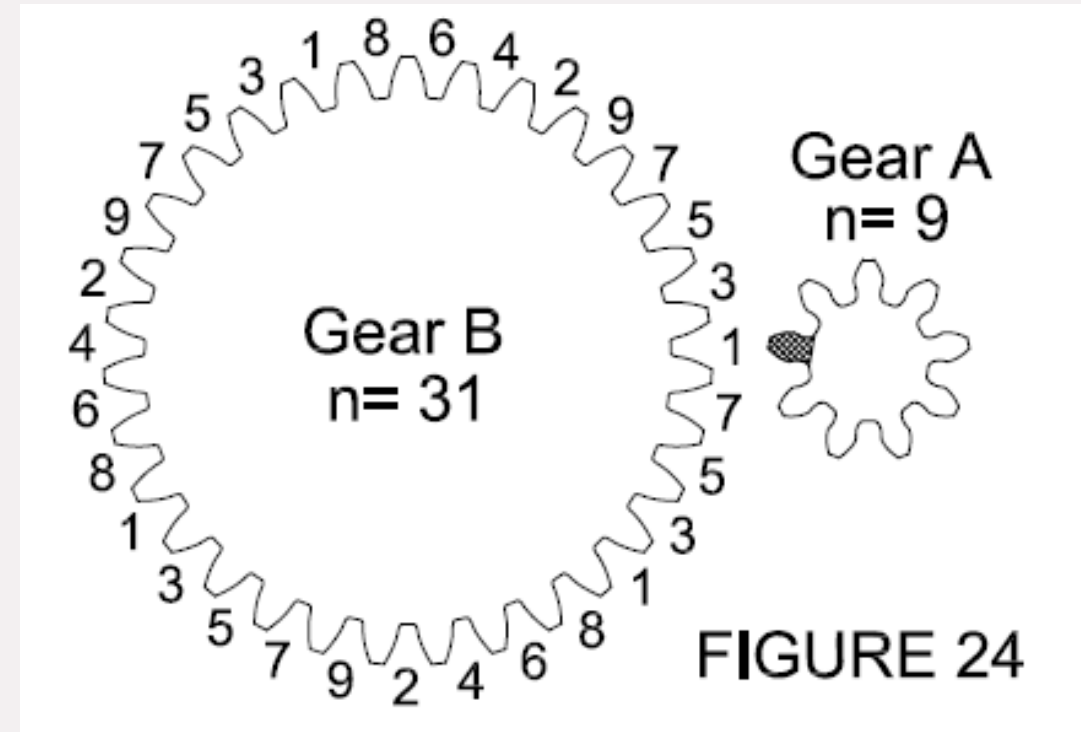


Image source: <https://engineering.stackexchange.com/questions/11394/why-are-spur-gear-ratios-not-always-whole-numbers-in-practice>

NOMENCLATURE OF SPUR-GEAR TEETH

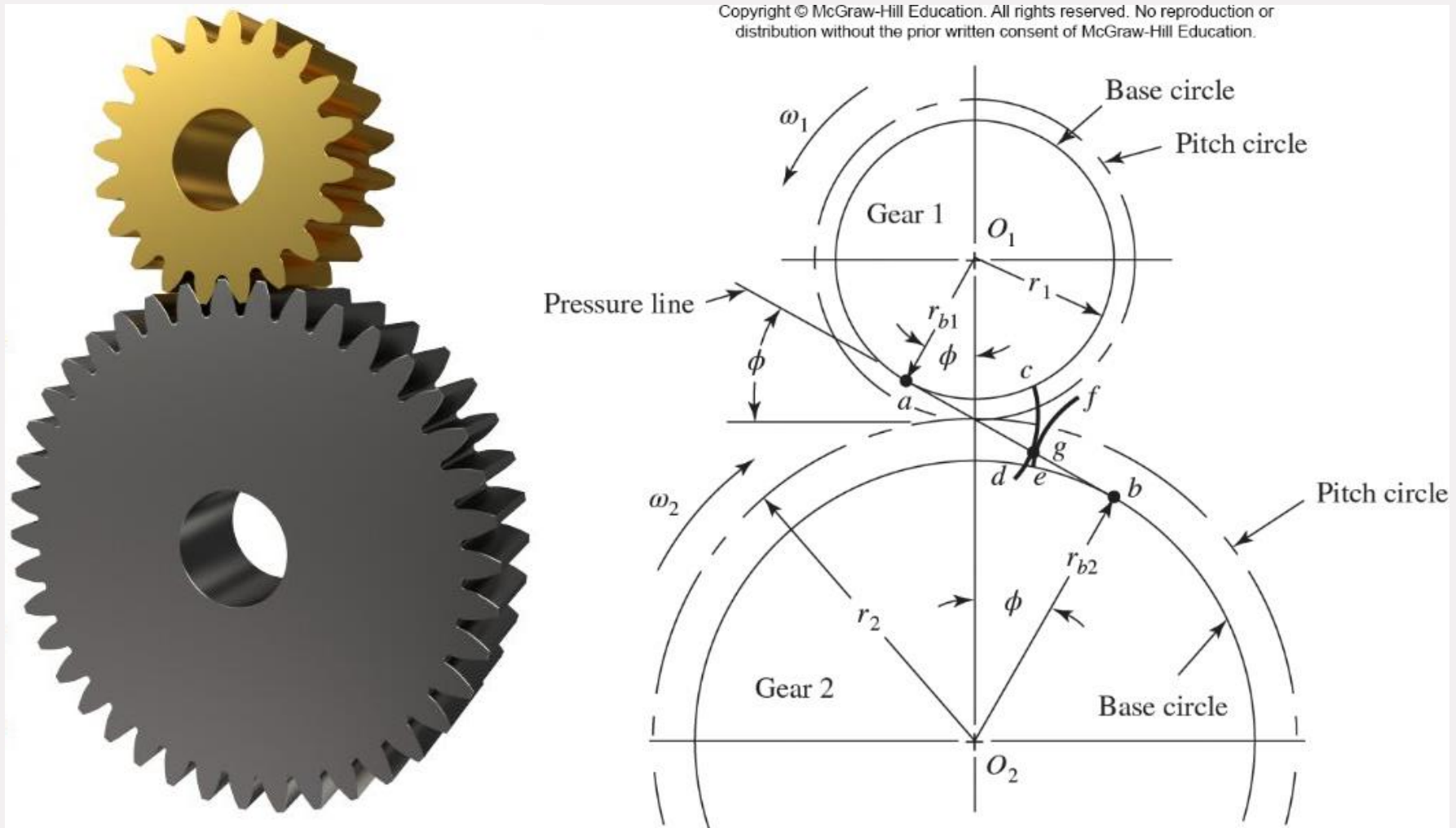


Fig. 13-7

NOMENCLATURE OF SPUR-GEAR TEETH

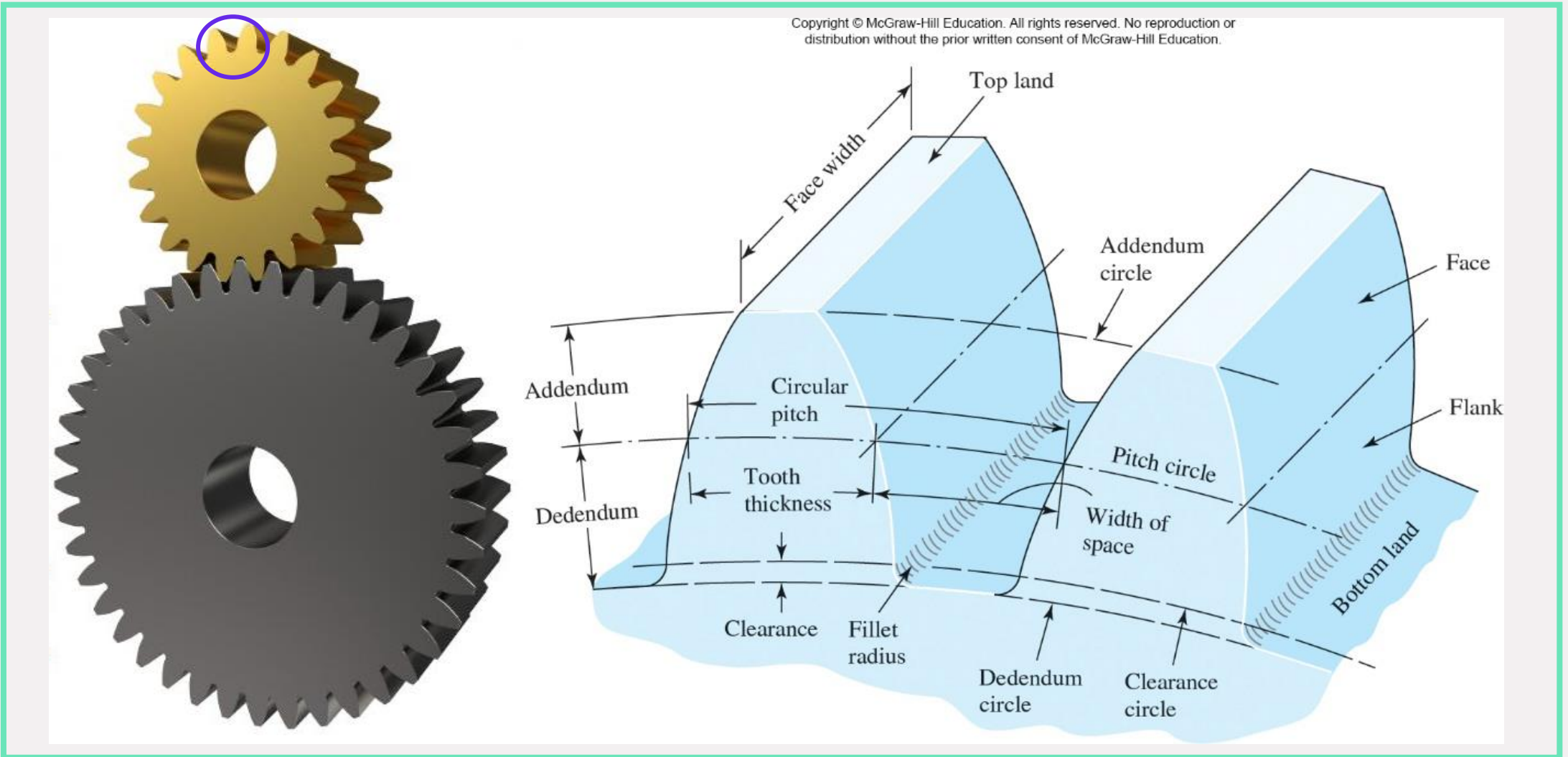


Fig. 13-5

TOOTH SIZES IN GENERAL USE

Diametral Pitch P (teeth/in)	
Coarse	2, $2\frac{1}{4}$, $2\frac{1}{2}$, 3, 4, 6, 8, 10, 12, 16
Fine	20, 24, 32, 40, 48, 64, 80, 96, 120, 150, 200

Module m (mm/tooth)	
Preferred	1, 1.25, 1.5, 2, 2.5, 3, 4, 5, 6, 8, 10, 12, 16, 20, 25, 32, 40, 50
Next Choice	1.125, 1.375, 1.75, 2.25, 2.75, 3.5, 4.5, 5.5, 7, 9, 11, 14, 18, 22, 28, 36, 45

Table 13–2

STANDARDIZED TOOTH SYSTEMS (SPUR GEARS)

Tooth System	Pressure Angle ϕ , deg	Addendum a	Dedendum b
Full depth	20	$1/P$ or m	$1.25/P$ or $1.25m$ $1.35/P$ or $1.35m$
	$22\frac{1}{2}$	$1/P$ or m	$1.25/P$ or $1.25m$ $1.35/P$ or $1.35m$
	25	$1/P$ or m	$1.25/P$ or $1.25m$ $1.35/P$ or $1.35m$
Stub	20	$0.8/P$ or $0.8m$	$1/P$ or m

Table 13–1

INVOLUTES

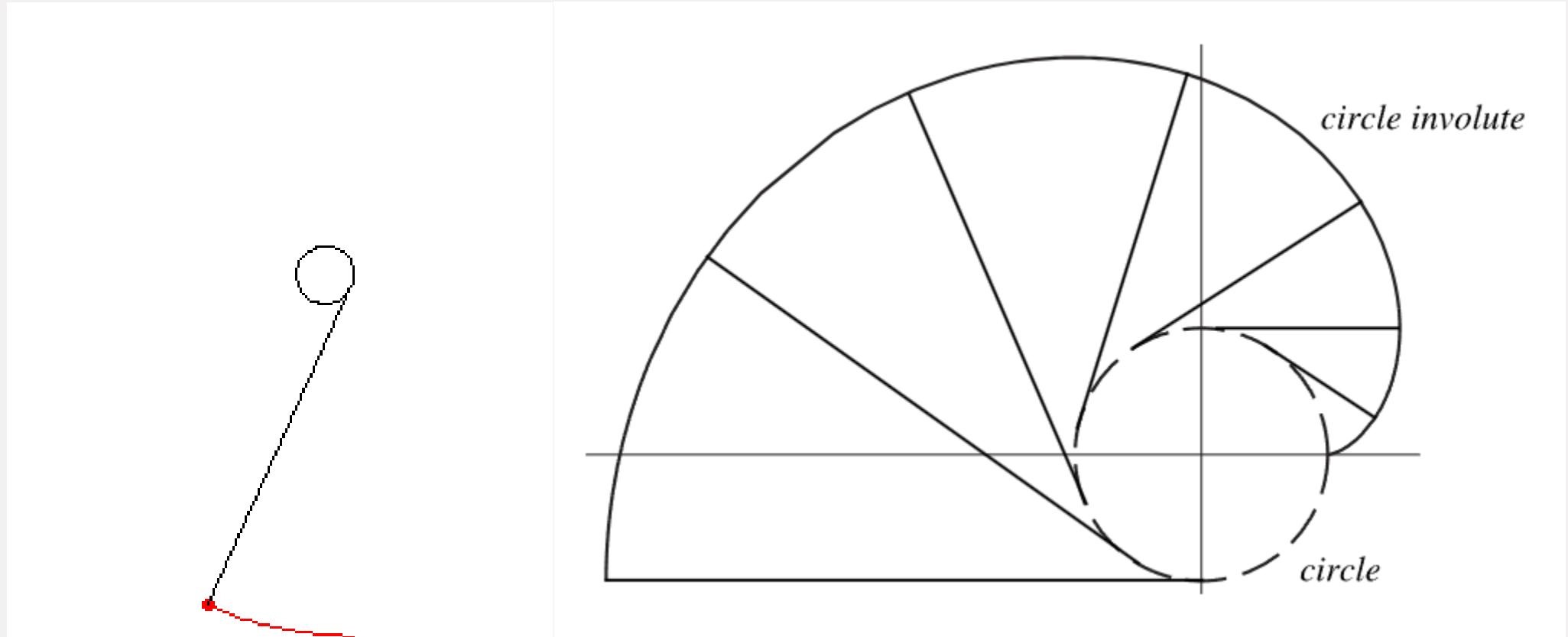
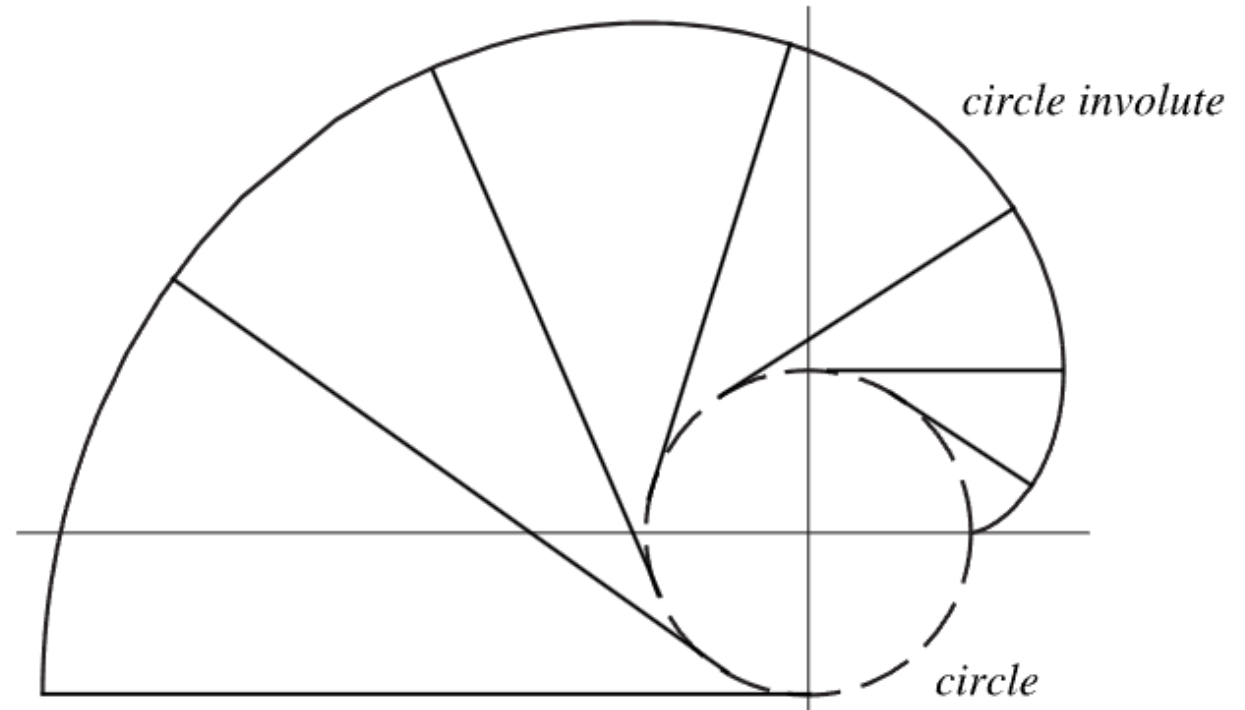
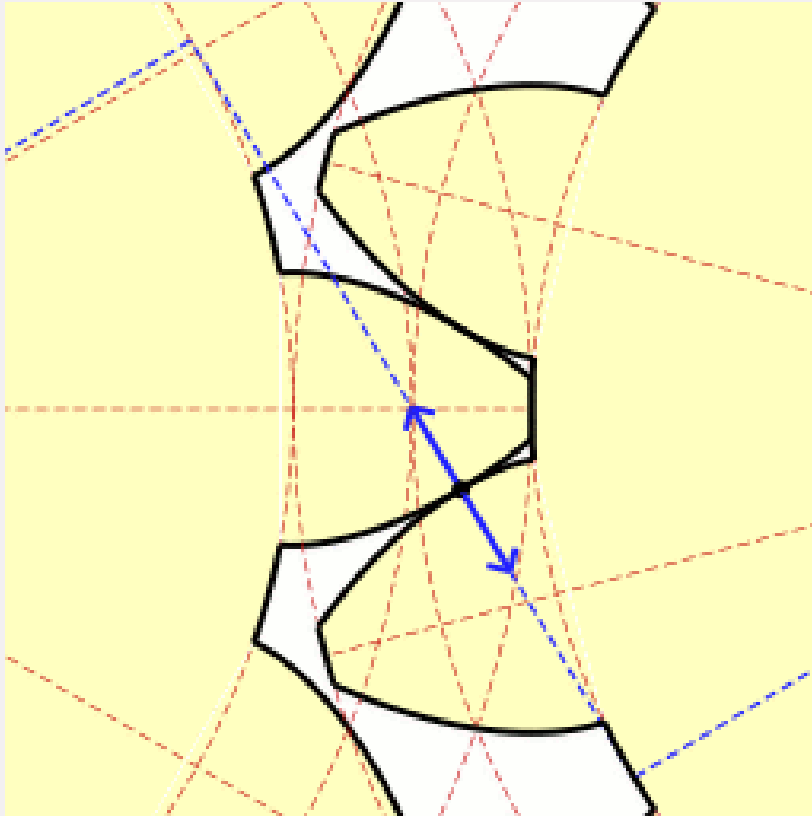


Image source: <https://mathworld.wolfram.com/Involute.html>

INVOLUTE GEAR TOOTH PROFILES



INVOLUTE GEAR TOOTH PROFILES

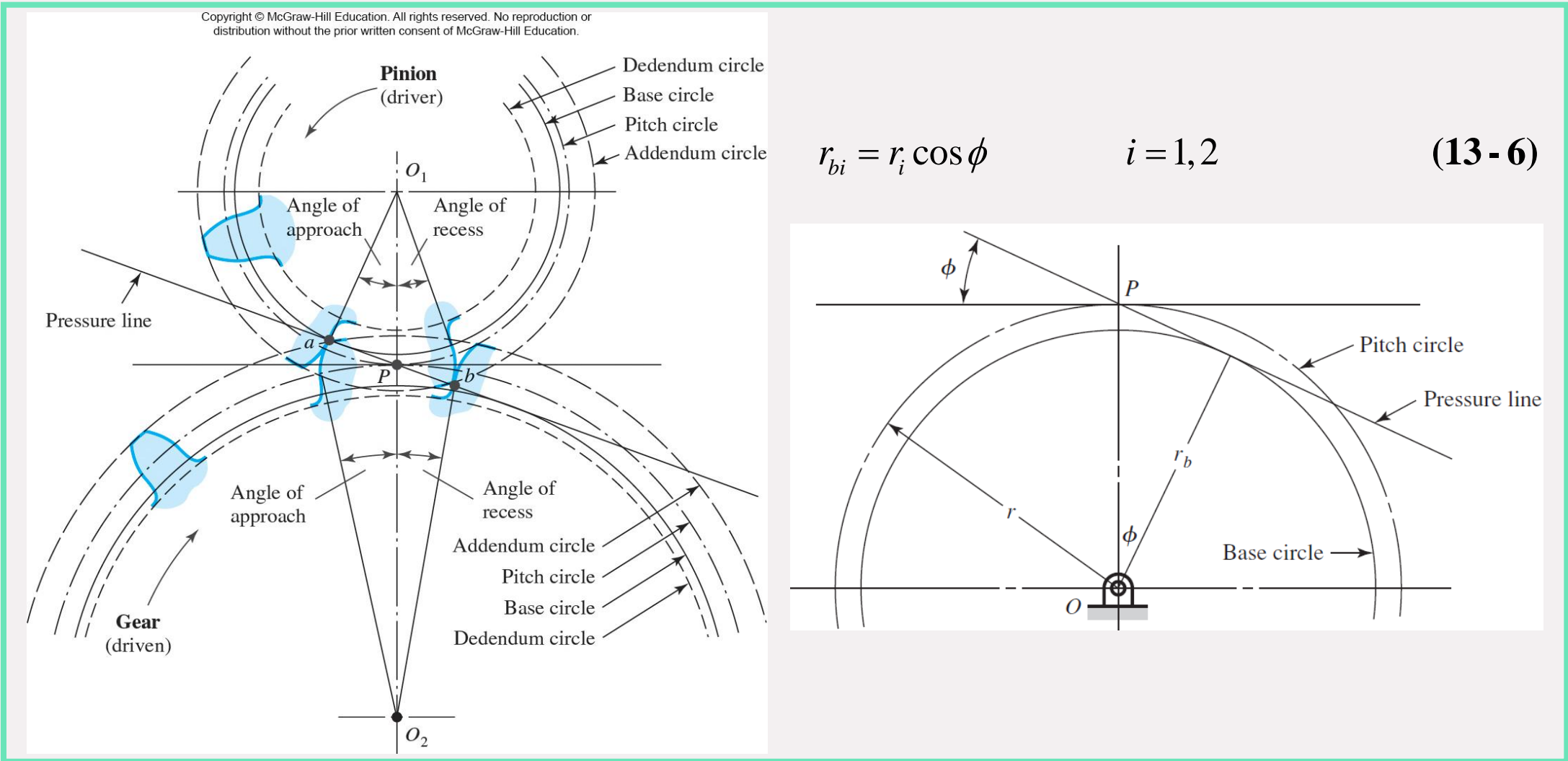


Fig. 13–8

CONTACT RATIO

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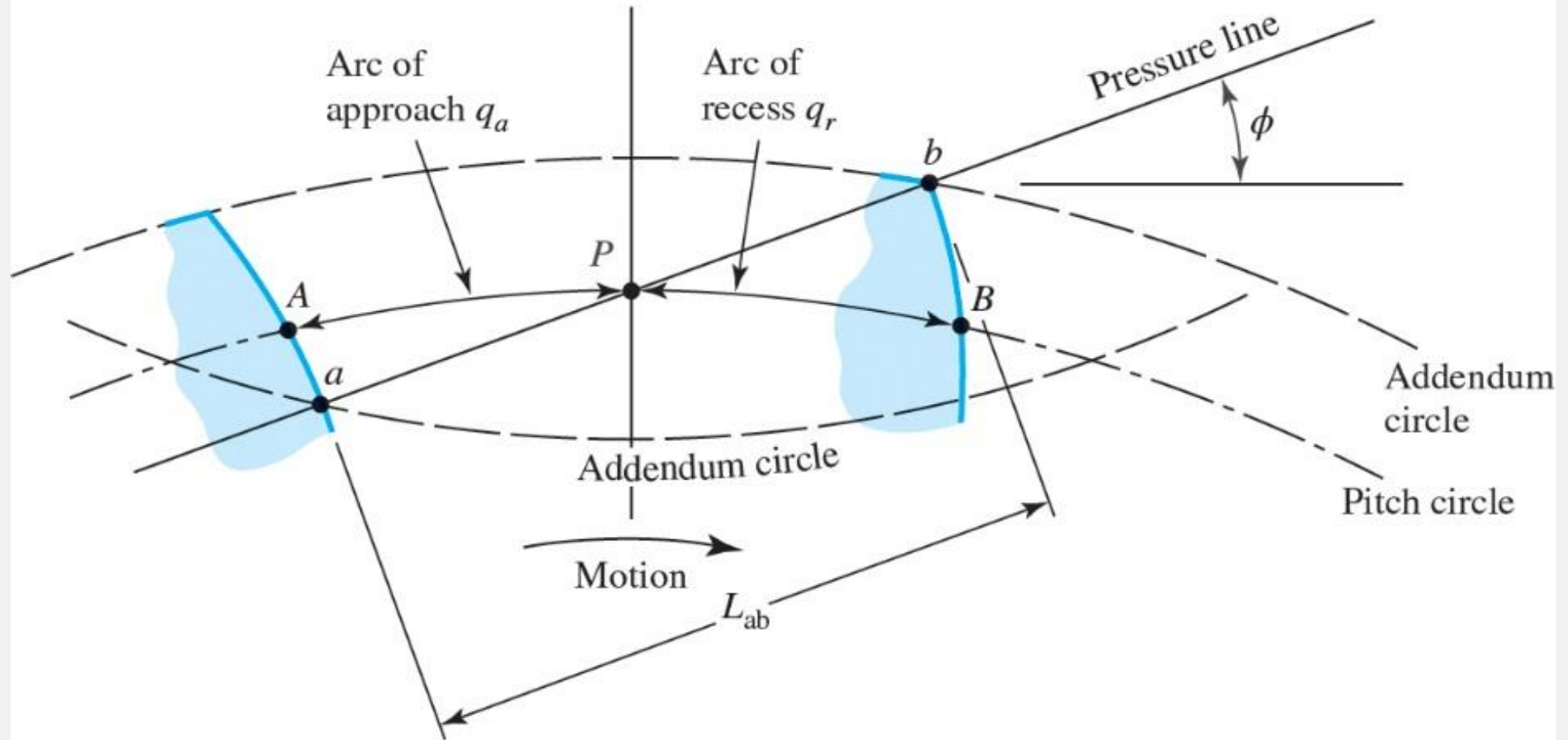


Fig. 13–11

INTERFERENCE

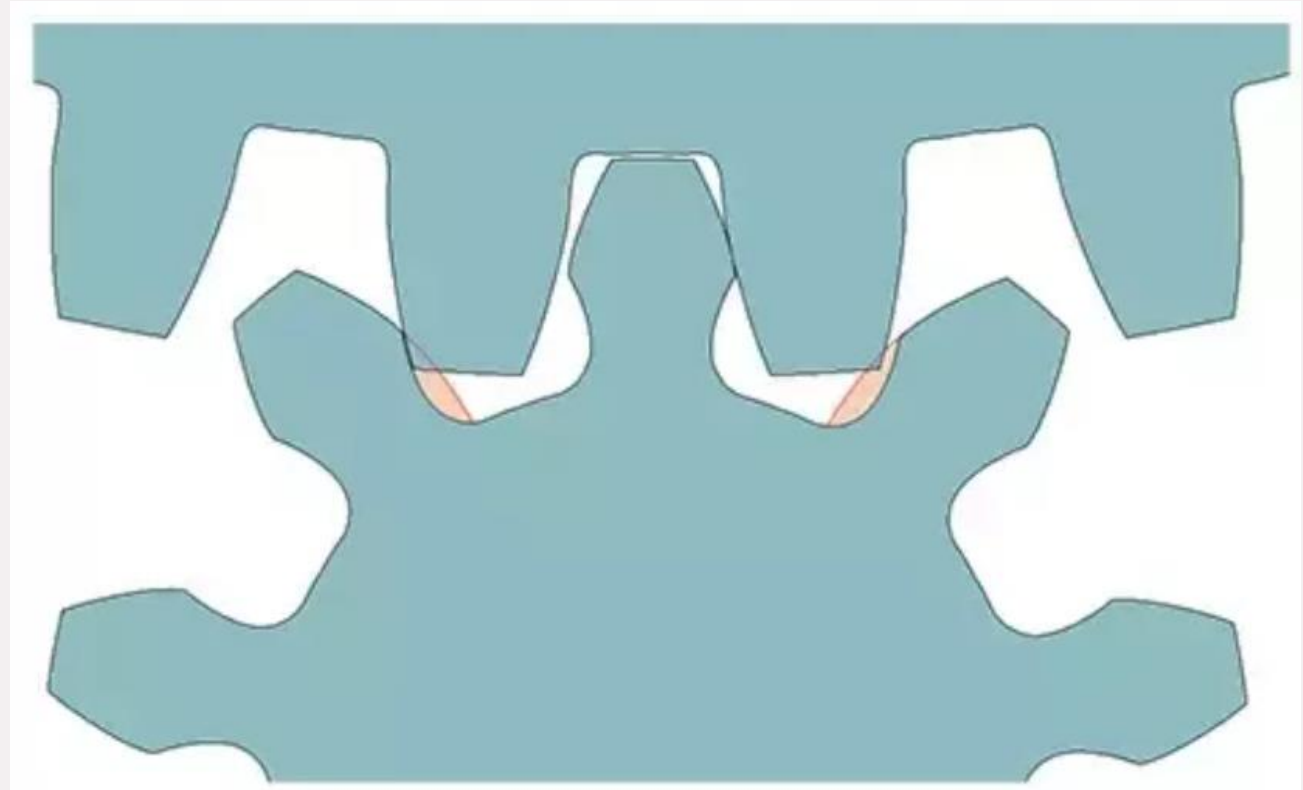
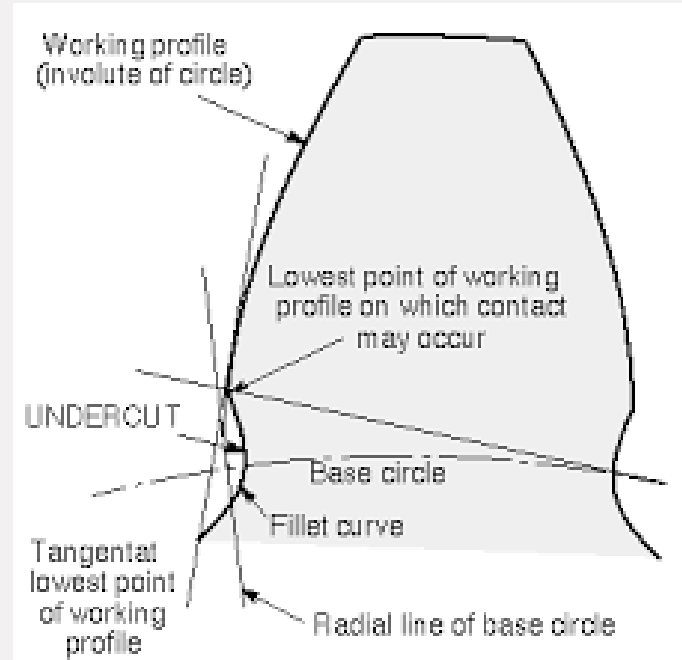


Image source: <https://www.quora.com/What-is-undercutting-in-gear>

