9 contd Alternatively, given the assumption $(\varepsilon_s)_{min} = 0.833$, the individual profile slipts might be gotten from (11):

with $\lambda = 0.5$ $\quad s_1 = (0.5 \times 38 + (0.83 - 0.5) \times 27)/65 = 0.43$

$\therefore s_2 = \varepsilon_s - s_1 = 0.83 - 0.43 = 0.40$

with $\lambda = 0.75$ $\quad s_1 = (0.75 \times 38 + (0.83 - 0.75) \times 27)/65 = 0.47$

$\therefore s_2 = \varepsilon_s - s_1 = 0.83 - 0.47 = 0.36$

So choose profile slipts:

$0.43 \leq s_1 \leq 0.47 \qquad 0.40 \geq s_2 \geq 0.36$

It can be seen that, here, the two methods give similar results.

10 (a) in all cases, $\hat{s} = 0.6$

N_1	13	23	36
s_1	0.425	0.175	-0.15
s_1	0.51	0.39	0.23
N_2	35	62	97
s_2	-0.125	-0.5	-0.5
s_2	0.24	0.05	0.05

from program 'Steel Spur Gears':

δ_1	0.446	0.472	0.482
δ_2	0.396	0.419	0.464
I	0.1186	0.1209	0.1180
ε_r	1.40	1.58	1.71

or, approximately from Notes eqs.

δ_1	0.444	0.469	0.488
δ_2	0.400	0.432	0.464
I	0.1192	0.1192	0.1192
ε_r	1.35	1.56	1.71

This gives an appreciation of the errors involved in the approximations (19)(18)(22).

For 23:62 case:

	from program	(b) min. slipts	(c) max. slipts
s_1		0.175	0.6
s_2		-0.5	0.6
δ_1		0.448	0.521
δ_2		0.373	0.475
I		0.1110	0.1289
ε_r		1.72	1.54

Generally, increasing profile slipt advantageously increases the geometry factors, but disadvantageously decreases contact ratio, as Fig 7.