PROBLEM 11-4

Statement: **A 78-tooth spur gear is in mesh with a 27-tooth pinion. The $p_d = 6$ and $\phi = 20°$. Find the contact ratio.**

Solution: **Also see the *TKSolver* file P11-04.**

St	Input	Name	Output	Unit	Comment
		contact	1.73		contact ratio

PROBLEM 11-9

Statement: **Design a two-stage compound spur gear train for an overall ratio of approximately 47:1. Specify tooth numbers for each gear in the train.**

Solution: **Also see the *TKSolver* file P11-09.**

St	Input	Name	Output	Unit	Comment
					gear set no. 1
	96.000	Ngear1			no. of teeth on gear 1
	14.000	Npinion1			no of teeth on pinion 1
	6.000	pd1		1/in	diametral pitch
	25.000	phi1		deg	nominal pressure angle
		mG1	6.857		gear ratio
					gear set no. 2
	96.000	Ngear2			no. of teeth on gear 2
	14.000	Npinion2			no of teeth on pinion 2
	6.000	pd2		1/in	diametral pitch
	25.000	phi2		deg	nominal pressure angle
		mG2	6.857		gear ratio
		mV	0.021		overall train ratio
		mG	47.020		overall gear ratio

PROBLEM 11-15

Statement: **If the gearset in Problem 11-4 transmits 33 kW at 1 600 pinion rpm, find the torque on each shaft.**

Solution: **Also see the *TKSolver* file P11-15.**

Rule Sheet:

See the rule sheet for Problem 11-14. It is the same.

Variable Sheet:

St	Input	Name	Output	Unit	Comment
		Tp	1 743.	in–lb	torque on pinion shaft
		Tg	5 036.	in–lb	torque on gear shaft

PROBLEM 11-17

Statement: **Size the spur gears in Problem 11-15 for a bending safety factor of 2.5 assuming a steady torque, 20° pressure angle, full-depth teeth, a face width factor of 12, $Q_v = 11$, an AISI 4340 steel pinion and an A-7-d nodular iron gear.**

Solution: **Also see the *TKSolver* file P11-17.**

Rule Sheet:

See the rule sheet for Problem 11-16. It is the same.

Variable Sheet:

St	Input	Name	Output	Unit	Comment
		face	2.00	in	face width

PROBLEM 11-19

Statement: **Size the spur gears in Problem 11-15 for a surface safety factor of 1.2 assuming a steady torque, 20° pressure angle, full-depth teeth, a face width factor of 12, $Q_v = 11$, an AISI 4340 steel pinion and an A-7-d nodular-iron gear.**

Solution: **Also see the *TKSolver* file P11-19.**

face	1.50	in	face width	