



evropský  
sociální  
fond v ČR



EVROPSKÁ UNIE



MINISTERSTVO ŠKOLSTVÍ,  
MLÁDEŽE A TĚLOVÝCHOVY



OP Vzdělávání  
pro konkurenceschopnost

INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ

## DUM téma: SurfCAM s tvorbou modelu – frézování 2D

ze sady: 2 tematický okruh sady: Příprava výroby a ruční programování  
CNC

ze šablony: 6 Příprava a zadání projektu

Určeno pro : 3 a 4 ročník

vzdělávací obor: 23-41-M/01 Strojírenství  
Vzdělávací oblast: odborné vzdělávání

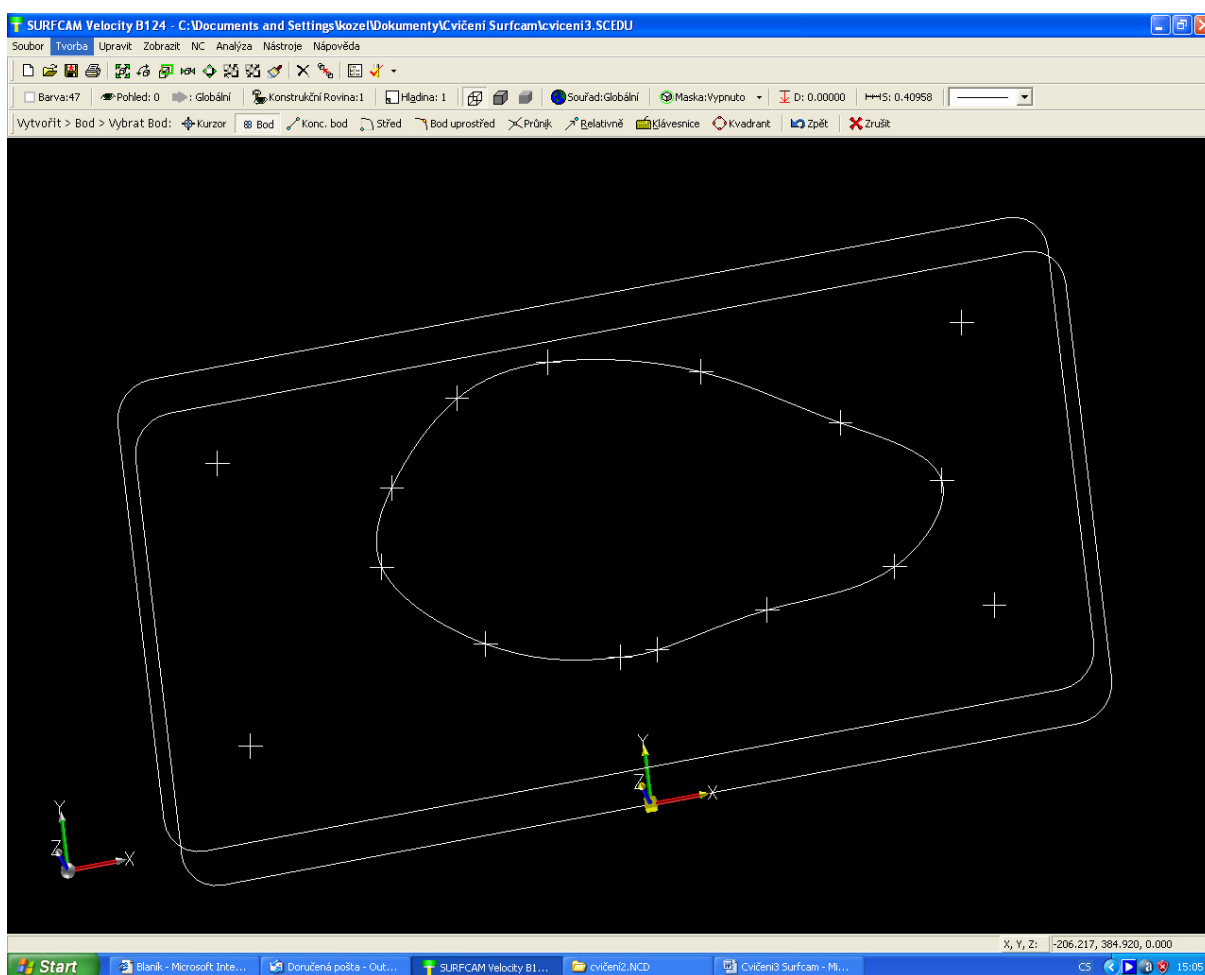
Metodický list/anotace: VY\_32\_INOVACE\_06209ml.pdf

Zpracoval: Ing. Bohuslav Kozel  
SPŠ a VOŠ Kladno

## DUM 09

### SurfCAM s tvorbou modelu – frézování 2D

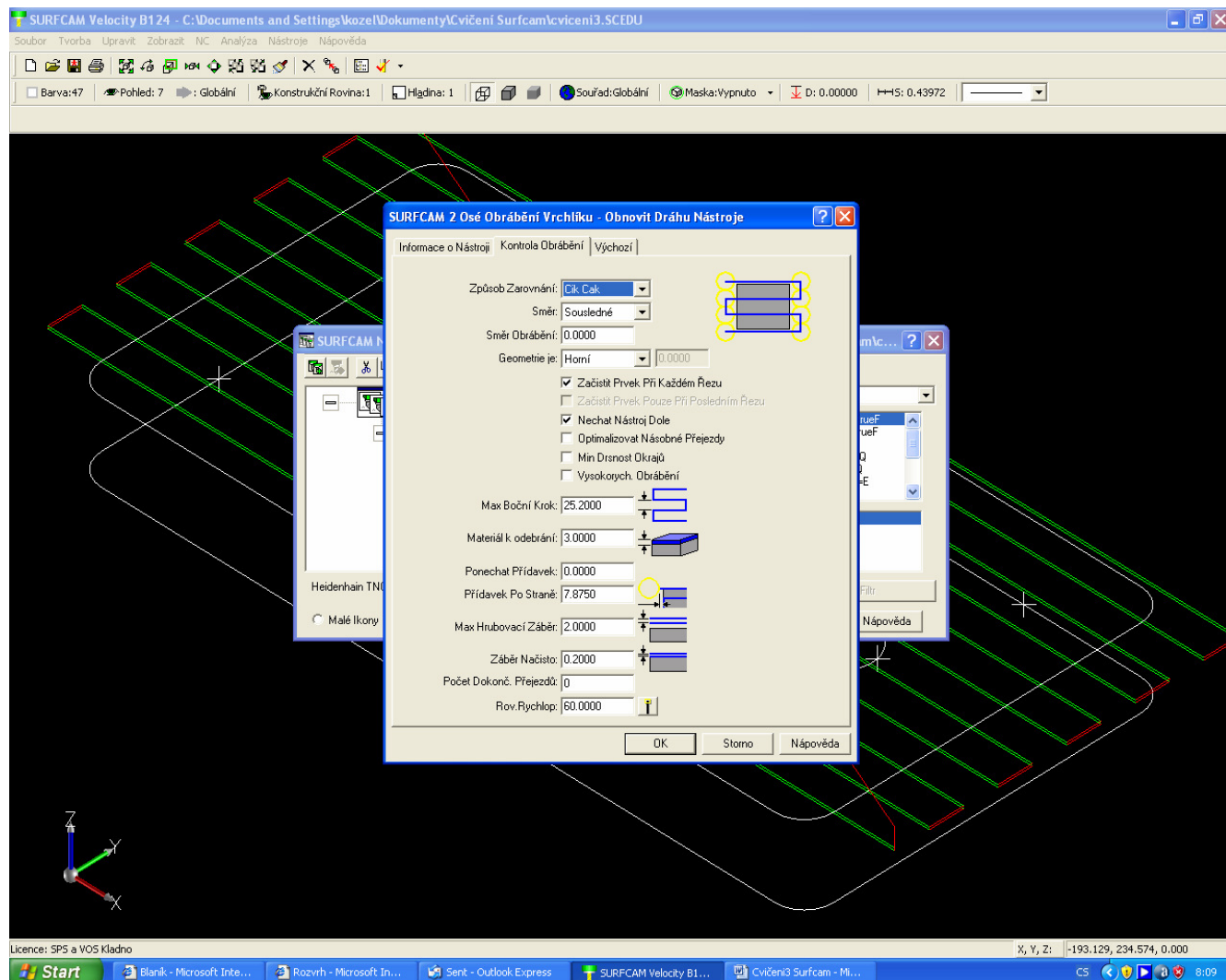
1. V prostředí Surfcam v konstrukční rovině 1 vytvořte obdélník o velikosti 500 x 250mm a zaoblete rohy. Vysuňte desku o 50mm. To bude rozměr hotové součásti. Vytvořte kvádr tak, aby nulový bod byl v uprostřed dole. Nakreslete 4 body symetricky v rozích na horní ploše. Vytvořte nepravidelný uzavřený tvar na horní ploše např. pomocí spline a posunutím o 50 mm. Pomozte si vytvořením pomocných bodů.



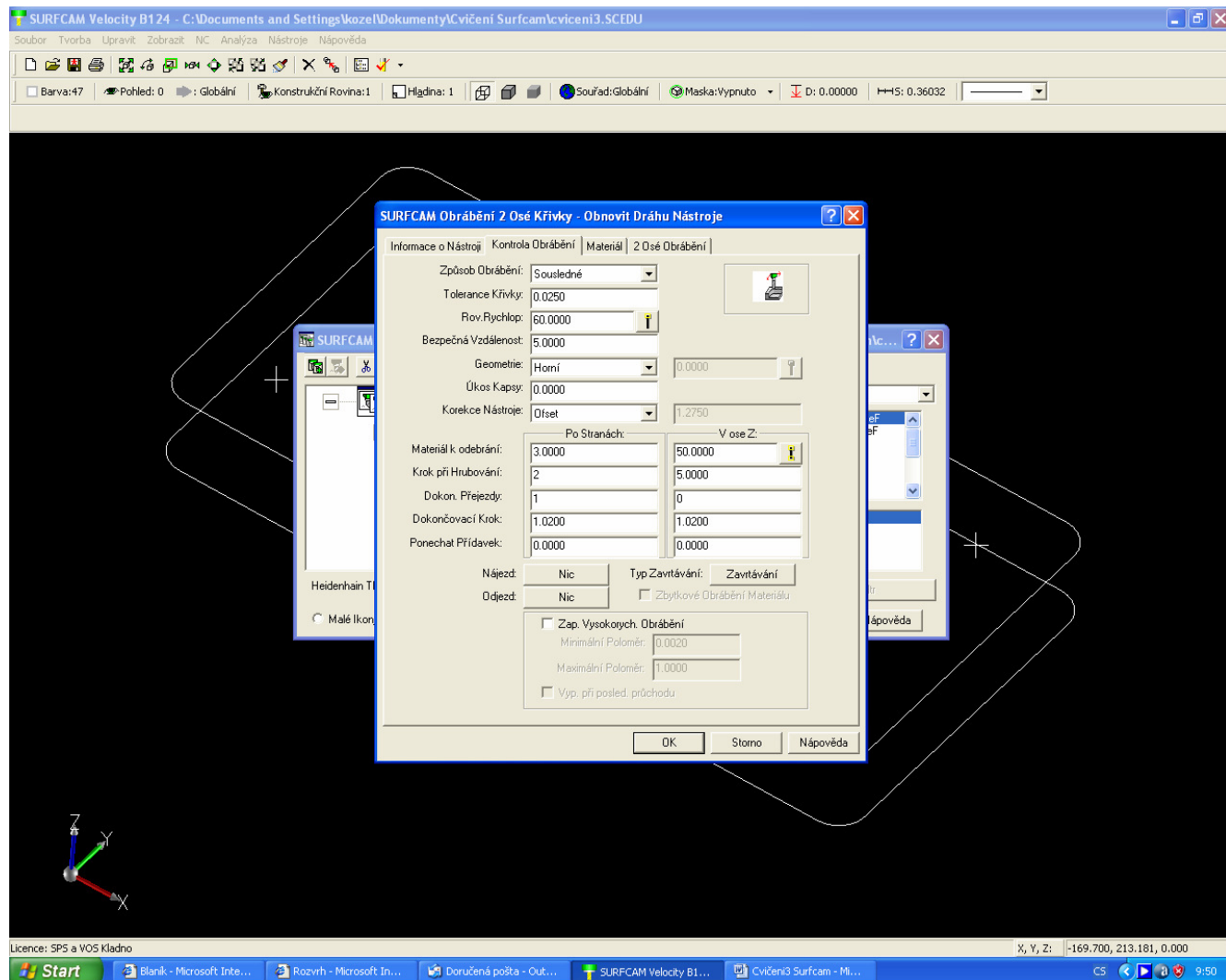
2. Provedeme tyto technologické operace
  - a. Velkou frézou zarovnání horního povrchu, přídavek je 3mm
  - b. Zarovnání kontury boků, výchozí polotovár má rozměry 506x256x53 mm
  - c. Kapsování nepravidelného tvaru do hloubky 20 mm

d. Vyvrtání a válcové zahloubení 4 otvorů v rozích

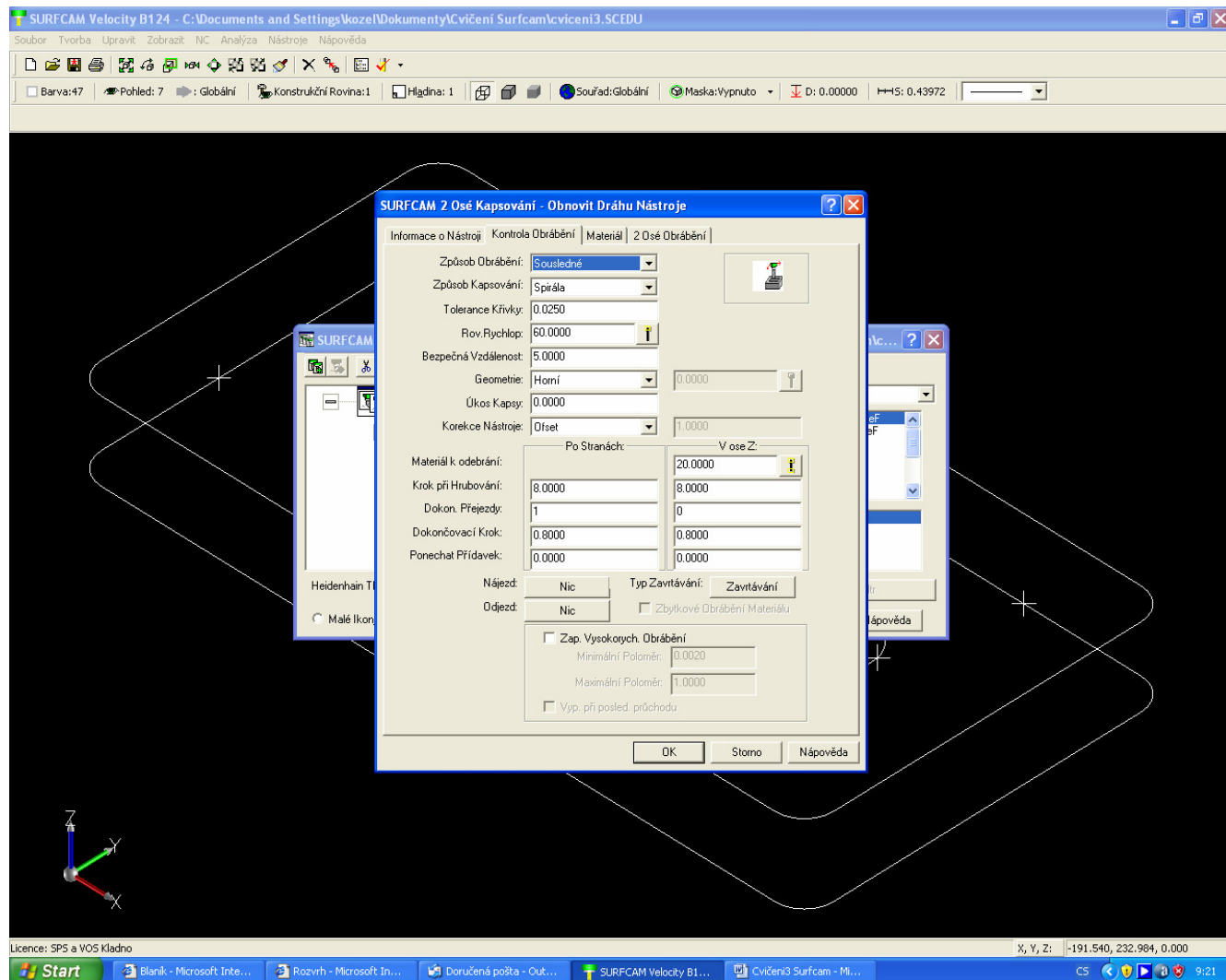
3. V NC menu volte 2D zarovnat, materiál k odebrání 3mm, hrubovací záběr např. 2mm, záběr na čisto 0.2mm



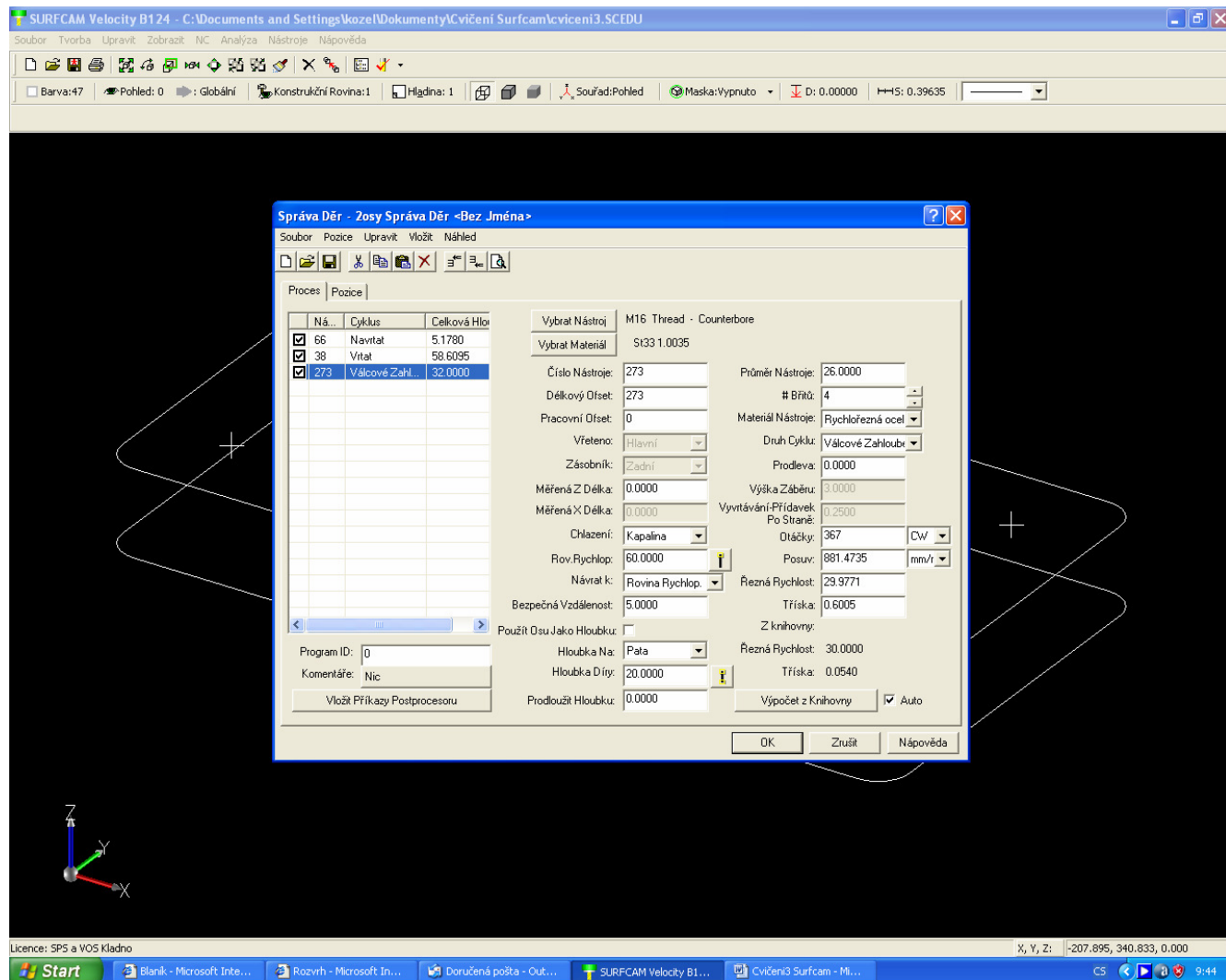
4. V NC menu volte kontura, volte kotoučovou frézu většího průměru, hloubku 50mm a šířku materiálu k odebrání 3mm. Výška kroku musí být menší než je výška frézy



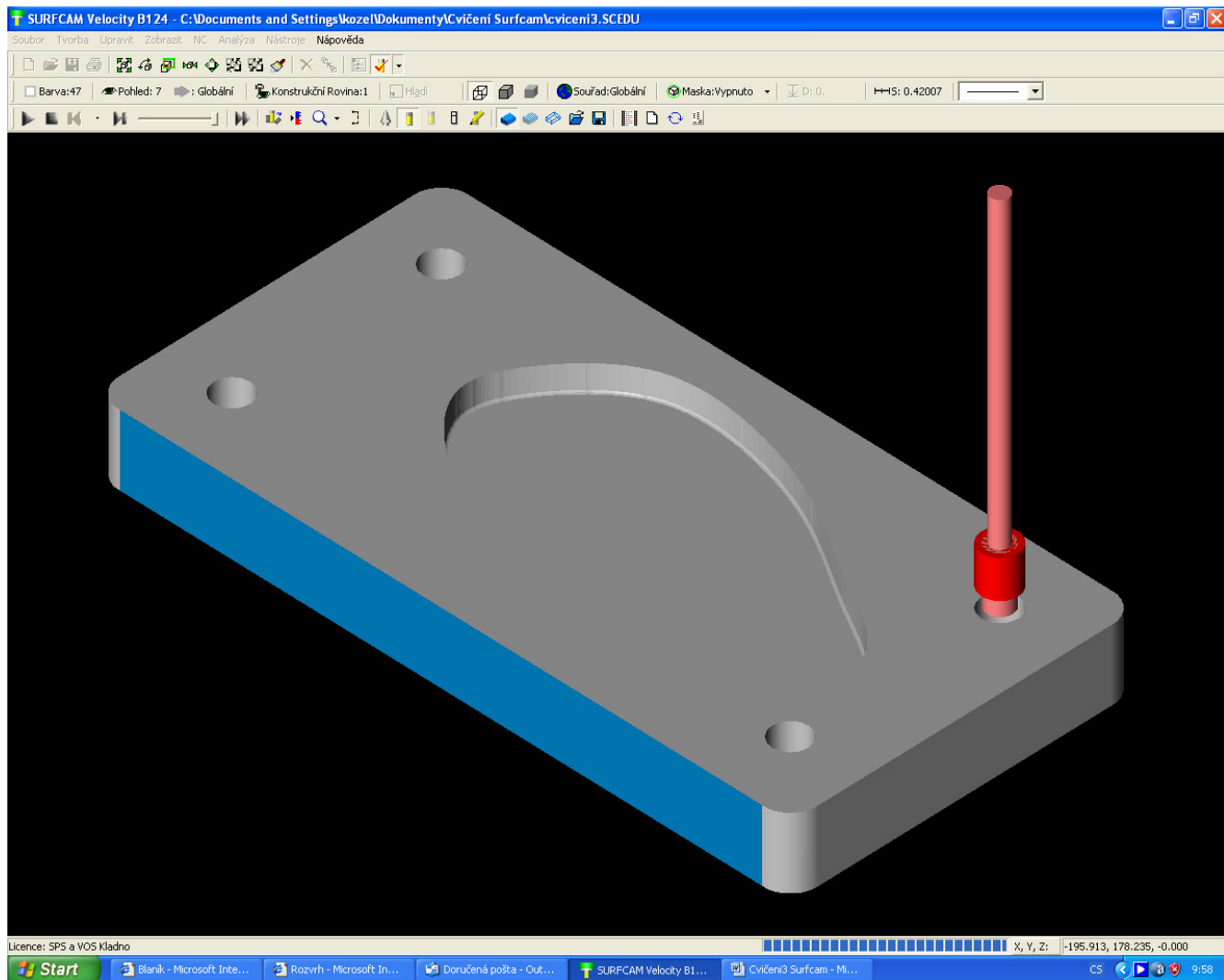
- Nyní budeme kapsovat, tj. vytvářet nepravidelný otvor do hloubky 20mm. Při volbě frézy platí, že by se měla vejít do všech radiusů na křivce. Volte frézu s radiusem, tento rádius zůstane na obrobené ploše dole. Zadejte hloubku tj. osa z 20mm. Fréza by měla mít délku alespoň 20mm



6. Poslední operací bude vrtání a zahloubení 4 otvorů. Na horní ploše máme 4 symetrické body, které použijeme jako středy vrtaných otvorů. Díra bude skrz, zahloubení pro válcovou hlavu šroubu. Nejprve ale navrtat navrtávkem. Délka vrtáku by měla být alespoň 50mm




7. To je vše, co můžeme vytvořit v demo verzi. V ostré je dále možné verifikovat, tj. zobrazit prostorový model a vyjet 3 dokumenty, operační list, nástrojový list a vlastní NC program. První je uvedena verifikace, NC program má asi 40 stránek




OPERATIONS LIST											
<b>Date:</b>		Thu Mar 23 2006									
<b>Time:</b>		09:53:52									
<b>Output Filename:</b>		cviceni3.INC									
Tool Number	Operation	Plunge Rate	Feed Rate	Spindle Speed	Min X	Min Y	Min Z	Max X	Max Y	Max Z	Cycle Time
168	2 Osé Obrábění Vrchlíku	132.629	265.26 mm/min	354 ot/min	- 289.3750	22.6250	47.0000	289.3750	257.0568	60.0000	0:48:0
343	2 Osé Obrábění Kontury	148.295	296.59 mm/min	374 ot/min	- 263.7700	- 13.7700	0.0000	263.7700	263.7700	60.0000	1:44:56
416	2 Osé Kapsování	120.321	240.64 mm/min	477 ot/min	- 111.4461	69.3418	30.0000	170.2646	210.2306	60.0000	0:55:46
66	2osy Správa Dir	-	412.53 mm/min	3820 ot/min	- 200.0000	50.0000	44.8220	200.0000	200.0000	60.0000	0:0:11
38	2osy Správa Dir	-	183.35 mm/min	477 ot/min	- 200.0000	50.0000	-8.6095	200.0000	200.0000	60.0000	0:1:31
273	2osy Správa Dir	-	881.47 mm/min	367 ot/min	- 200.0000	50.0000	18.0000	200.0000	200.0000	60.0000	0:0:17


<b>Overall</b>		-	-	-8.6095	289.3750	263.7700	60.0000	3:30:45
289.3750	13.7700							
Operation Number	Tool Number	Comments						
1	168	<b>Operation Comments:</b>	-					
		<b>Tool Comments:</b>	63mm dia - 5 flt - Carbide Insert Mill					
2	343	<b>Operation Comments:</b>	-					
		<b>Tool Comments:</b>	25.5mm dia - 6.0mm flute - Keycutter					
3	416	<b>Operation Comments:</b>	-					
		<b>Tool Comments:</b>	20mm dia - 1.5mm rad - Bullmill					
4	66	<b>Operation Comments:</b>	-					
		<b>Tool Comments:</b>	2.50mm Center Drill - HSS					
5	38	<b>Operation Comments:</b>	-					
		<b>Tool Comments:</b>	20.0mm HSS Drill					
6	273	<b>Operation Comments:</b>	-					

	<h1>TOOLING LIST</h1>
<b>Date:</b>	Thu Mar 23 2006
<b>Time:</b>	09:53:52
<b>Output Filename:</b>	cviceni3.INC

<b>Description:</b>	63mm dia - 5 flt - Carbide Insert Mill
<b>Tool Number:</b>	168
<b>Length Register:</b>	168
<b>Diameter Register:</b>	168
<b>Diameter:</b>	63.0000
<b>Corner Radius:</b>	1.0000
<b>Flute Length:</b>	10.0000
<b>Total Length:</b>	63.0000
<b>Number of Flutes:</b>	5

<b>Description:</b>	25.5mm dia - 6.0mm flute - Keycutter	
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<b>Diameter Register:</b>	<b>343</b>	
<b>Diameter:</b>	<b>25.5000</b>	
<b>Corner Radius:</b>	<b>0.0000</b>	
<b>Flute Length:</b>	<b>6.0000</b>	
<b>Total Length:</b>	<b>60.0000</b>	
<b>Number of Flutes:</b>	<b>12</b>	
<b>Program Point:</b>	<b>Hrot</b>	

<b>Description:</b>	<b>20mm dia - 1.5mm rad - Bullmill</b>	
<b>Tool Number:</b>	<b>416</b>	
<b>Length Register:</b>	<b>416</b>	
<b>Diameter Register:</b>	<b>416</b>	
<b>Diameter:</b>	<b>20.0000</b>	
<b>Corner Radius:</b>	<b>1.5000</b>	
<b>Flute Length:</b>	<b>30.0000</b>	
<b>Total Length:</b>	<b>70.0000</b>	
<b>Number of Flutes:</b>	<b>4</b>	

<b>Description:</b>	<b>2.50mm Center Drill - HSS</b>	
<b>Tool Number:</b>	<b>66</b>	
<b>Length Register:</b>	<b>66</b>	
<b>Diameter:</b>	<b>2.5000</b>	
<b>Tip Angle:</b>	<b>118.0000</b>	
<b>Flute Length:</b>	<b>2.5000</b>	
<b>Total Length:</b>	<b>46.0000</b>	
<b>Number of Flutes:</b>	<b>2</b>	

<b>Description:</b>	<b>20.0mm HSS Drill</b>	
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<b>Length Register:</b>	<b>38</b>	
<b>Diameter:</b>	<b>20.0000</b>	
<b>Tip Angle:</b>	<b>118.0000</b>	
<b>Flute Length:</b>	<b>50.0000</b>	
<b>Total Length:</b>	<b>260.0000</b>	
<b>Number of Flutes:</b>	<b>2</b>	
<b>Program Point:</b>	<b>Hrot</b>	
<b>Description:</b>	<b>M16 Thread - Counterbore</b>	
<b>Tool Number:</b>	<b>273</b>	
<b>Length Register:</b>	<b>273</b>	
<b>Diameter:</b>	<b>26.0000</b>	
<b>Tip Angle:</b>	<b>0.0000</b>	
<b>Flute Length:</b>	<b>25.0000</b>	
<b>Total Length:</b>	<b>228.6000</b>	
<b>Number of Flutes:</b>	<b>4</b>	

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0 BEGIN PGM cviceni3Nastavení_Jedna MM
1 ; POZOR! Byly nalezeny rychloposuvy nad materialem v jine nez prvotni (Z60)
  rovine rychloposuvu!
2 ; -- DEFINICE POLOTOVARU
3 BLK FORM 0.1 Z X-289.375 Y-13.77 Z0
4 BLK FORM 0.2 X289.375 Y263.77 Z48.5
5 ; -- DEFINICE CYKLU PRO PLYNULE PRUJEZDY
6 CYCL DEF 32.0 TOLERANCE
7 CYCL DEF 32.1 T0.04
8 ; -- SEZNAM NASTROJU POUZITYCH V TOMTO PROGRAMU
9 ; T168  FREZA CELNI - PRUM 63./ ROHOVY RADIUS 1.
10 ; T343  FREZA KOTOUCOVA - PRUM 25.5/ ROHOVY RADIUS 0
11 ; T416  FREZA CTVRTKOVA - PRUM 20./ ROHOVY RADIUS 1.5
12 ; T66   NAVRTAVACEK - PRUM 2.5
13 ; T38   VRTAK - PRUM 20.
14 ; T273  VALCOVY ZAHLUBNIK - PRUM 26.
15 ; -- KONEC SEZNAMU --
16 M78 ;(TEPELNA KOMPENZACE)
17 ; T168  FREZA CELNI - PRUM 63./ ROHOVY RADIUS 1.
18 ; -- DEFINICE POSUVU PRO NASTROJ
19 FN 0: Q1 = 132.6291 ;(ZAPICHOVACI POSUV)
20 FN 0: Q2 = 265.2582 ;(PRACOVNI POSUV)
21 FN 0: Q3 = 20000 ;(PLYNULY RYCHLOPOSUV)

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22 TOOL CALL 168 Z S354
23 L M6
24 L Z+60. R0 FMAX M8
25 L X-282.852 Y+257.057 FMAX M3
26 L Z+48.5 FMAX
27 Q22 = Q2*1.
28 FQ22
29 L X+282.852
30 L X+289.265 FMAX
31 L Y+233.614 FMAX
32 L X-289.265
33 L X-289.375 FMAX
34 L Y+210.171 FMAX
35 L X+289.375
36 L Y+186.727 FMAX
37 L X-289.375
38 L Y+163.284 FMAX
39 L X+289.375
40 L Y+139.841 FMAX
41 L X-289.375
42 L Y+116.398 FMAX
43 L X+289.375
44 L Y+92.955 FMAX
45 L X-289.375
46 L Y+69.511 FMAX
47 L X+289.375
48 L Y+46.068 FMAX
49 L X-289.375
50 L Y+22.625 FMAX
51 L X+289.375
52 L Z+60. FMAX
53 L X-282.852 Y+257.057 FMAX
54 L Z+47. FMAX
55 L X+282.852
56 L X+289.265 FMAX
57 L Y+233.614 FMAX
58 L X-289.265
59 L X-289.375 FMAX
60 L Y+210.171 FMAX
61 L X+289.375
62 L Y+186.727 FMAX
63 L X-289.375
64 L Y+163.284 FMAX
65 L X+289.375
66 L Y+139.841 FMAX
67 L X-289.375
68 L Y+116.398 FMAX
69 L X+289.375
70 L Y+92.955 FMAX
71 L X-289.375
72 L Y+69.511 FMAX
73 L X+289.375
74 L Y+46.068 FMAX
75 L X-289.375
76 L Y+22.625 FMAX
77 L X+289.375
78 L Z+60. FMAX
79 L Z+60. R0 FMAX
80 M9
81 ; T343 FREZA KOTOUCOVA - PRUM 25.5/ ROHOVY RADIUS 0
82 ; -- DEFINICE POSUVU PRO NASTROJ
83 FN 0: Q1 = 148.295 ; (ZAPICHOVACI POSUV)
84 FN 0: Q2 = 296.5899 ; (PRACOVNI POSUV)
85 FN 0: Q3 = 20000 ; (PLYNULY RYCHLOPOSUV)
86 TOOL CALL 343 Z S374

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87 L M6  
88 L Z+60. R0 FMAX M8  
89 L X-230. Y-13.77 FMAX M3  
90 L Z+55. FMAX  
91 FQ1  
92 L Z+45.  
93 Q22 = Q2\*1.  
94 FQ22  
95 CC X-230. Y+20.  
96 C X-263.77 Y+20. DR-  
97 L X-263.77 Y+230.  
98 CC X-230. Y+230.  
99 C X-230. Y+263.77 DR-  
100 L X+230. Y+263.77  
101 CC X+230. Y+230.  
102 C X+263.77 Y+230. DR-  
103 L X+263.77 Y+20.  
104 CC X+230. Y+20.  
105 C X+230. Y-13.77 DR-  
106 L X-230. Y-13.77  
107 L Y-12.75  
108 CC X-230. Y+20.  
109 C X-262.75 Y+20. DR-  
110 L X-262.75 Y+230.  
111 CC X-230. Y+230.  
112 C X-230. Y+262.75 DR-  
113 L X+230. Y+262.75  
114 CC X+230. Y+230.  
115 C X+262.75 Y+230. DR-  
116 L X+262.75 Y+20.  
117 CC X+230. Y+20.  
118 C X+230. Y-12.75 DR-  
119 L X-230. Y-12.75  
120 L Y-13.77  
121 FQ1  
122 L Z+40.  
123 Q22 = Q2\*1.  
124 FQ22  
125 CC X-230. Y+20.  
126 C X-263.77 Y+20. DR-  
127 L X-263.77 Y+230.  
128 CC X-230. Y+230.  
129 C X-230. Y+263.77 DR-  
130 L X+230. Y+263.77  
131 CC X+230. Y+230.  
132 C X+263.77 Y+230. DR-  
133 L X+263.77 Y+20.  
134 CC X+230. Y+20.  
135 C X+230. Y-13.77 DR-  
136 L X-230. Y-13.77  
137 L Y-12.75  
138 CC X-230. Y+20.  
139 C X-262.75 Y+20. DR-  
140 L X-262.75 Y+230.  
141 CC X-230. Y+230.  
142 C X-230. Y+262.75 DR-  
143 L X+230. Y+262.75  
144 CC X+230. Y+230.  
145 C X+262.75 Y+230. DR-  
146 L X+262.75 Y+20.  
147 CC X+230. Y+20.  
148 C X+230. Y-12.75 DR-  
149 L X-230. Y-12.75  
150 L Y-13.77  
151 FQ1

152 L Z+35.  
153 Q22 = Q2\*1.  
154 FQ22  
155 CC X-230. Y+20.  
156 C X-263.77 Y+20. DR-  
157 L X-263.77 Y+230.  
158 CC X-230. Y+230.  
159 C X-230. Y+263.77 DR-  
160 L X+230. Y+263.77  
161 CC X+230. Y+230.  
162 C X+263.77 Y+230. DR-  
163 L X+263.77 Y+20.  
164 CC X+230. Y+20.  
165 C X+230. Y-13.77 DR-  
166 L X-230. Y-13.77  
167 L Y-12.75  
168 CC X-230. Y+20.  
169 C X-262.75 Y+20. DR-  
170 L X-262.75 Y+230.  
171 CC X-230. Y+230.  
172 C X-230. Y+262.75 DR-  
173 L X+230. Y+262.75  
174 CC X+230. Y+230.  
175 C X+262.75 Y+230. DR-  
176 L X+262.75 Y+20.  
177 CC X+230. Y+20.  
178 C X+230. Y-12.75 DR-  
179 L X-230. Y-12.75  
180 L Y-13.77  
181 FQ1  
182 L Z+30.  
183 Q22 = Q2\*1.  
184 FQ22  
185 CC X-230. Y+20.  
186 C X-263.77 Y+20. DR-  
187 L X-263.77 Y+230.  
188 CC X-230. Y+230.  
189 C X-230. Y+263.77 DR-  
190 L X+230. Y+263.77  
191 CC X+230. Y+230.  
192 C X+263.77 Y+230. DR-  
193 L X+263.77 Y+20.  
194 CC X+230. Y+20.  
195 C X+230. Y-13.77 DR-  
196 L X-230. Y-13.77  
197 L Y-12.75  
198 CC X-230. Y+20.  
199 C X-262.75 Y+20. DR-  
200 L X-262.75 Y+230.  
201 CC X-230. Y+230.  
202 C X-230. Y+262.75 DR-  
203 L X+230. Y+262.75  
204 CC X+230. Y+230.  
205 C X+262.75 Y+230. DR-  
206 L X+262.75 Y+20.  
207 CC X+230. Y+20.  
208 C X+230. Y-12.75 DR-  
209 L X-230. Y-12.75  
210 L Y-13.77  
211 FQ1  
212 L Z+25.  
213 Q22 = Q2\*1.  
214 FQ22  
215 CC X-230. Y+20.  
216 C X-263.77 Y+20. DR-

217 L X-263.77 Y+230.  
218 CC X-230. Y+230.  
219 C X-230. Y+263.77 DR-  
220 L X+230. Y+263.77  
221 CC X+230. Y+230.  
222 C X+263.77 Y+230. DR-  
223 L X+263.77 Y+20.  
224 CC X+230. Y+20.  
225 C X+230. Y-13.77 DR-  
226 L X-230. Y-13.77  
227 L Y-12.75  
228 CC X-230. Y+20.  
229 C X-262.75 Y+20. DR-  
230 L X-262.75 Y+230.  
231 CC X-230. Y+230.  
232 C X-230. Y+262.75 DR-  
233 L X+230. Y+262.75  
234 CC X+230. Y+230.  
235 C X+262.75 Y+230. DR-  
236 L X+262.75 Y+20.  
237 CC X+230. Y+20.  
238 C X+230. Y-12.75 DR-  
239 L X-230. Y-12.75  
240 L Y-13.77  
241 FQ1  
242 L Z+20.  
243 Q22 = Q2\*1.  
244 FQ22  
245 CC X-230. Y+20.  
246 C X-263.77 Y+20. DR-  
247 L X-263.77 Y+230.  
248 CC X-230. Y+230.  
249 C X-230. Y+263.77 DR-  
250 L X+230. Y+263.77  
251 CC X+230. Y+230.  
252 C X+263.77 Y+230. DR-  
253 L X+263.77 Y+20.  
254 CC X+230. Y+20.  
255 C X+230. Y-13.77 DR-  
256 L X-230. Y-13.77  
257 L Y-12.75  
258 CC X-230. Y+20.  
259 C X-262.75 Y+20. DR-  
260 L X-262.75 Y+230.  
261 CC X-230. Y+230.  
262 C X-230. Y+262.75 DR-  
263 L X+230. Y+262.75  
264 CC X+230. Y+230.  
265 C X+262.75 Y+230. DR-  
266 L X+262.75 Y+20.  
267 CC X+230. Y+20.  
268 C X+230. Y-12.75 DR-  
269 L X-230. Y-12.75  
270 L Y-13.77  
271 FQ1  
272 L Z+15.  
273 Q22 = Q2\*1.  
274 FQ22  
275 CC X-230. Y+20.  
276 C X-263.77 Y+20. DR-  
277 L X-263.77 Y+230.  
278 CC X-230. Y+230.  
279 C X-230. Y+263.77 DR-  
280 L X+230. Y+263.77  
281 CC X+230. Y+230.

282 C X+263.77 Y+230. DR-  
283 L X+263.77 Y+20.  
284 CC X+230. Y+20.  
285 C X+230. Y-13.77 DR-  
286 L X-230. Y-13.77  
287 L Y-12.75  
288 CC X-230. Y+20.  
289 C X-262.75 Y+20. DR-  
290 L X-262.75 Y+230.  
291 CC X-230. Y+230.  
292 C X-230. Y+262.75 DR-  
293 L X+230. Y+262.75  
294 CC X+230. Y+230.  
295 C X+262.75 Y+230. DR-  
296 L X+262.75 Y+20.  
297 CC X+230. Y+20.  
298 C X+230. Y-12.75 DR-  
299 L X-230. Y-12.75  
300 L Y-13.77  
301 FQ1  
302 L Z+10.  
303 Q22 = Q2\*1.  
304 FQ22  
305 CC X-230. Y+20.  
306 C X-263.77 Y+20. DR-  
307 L X-263.77 Y+230.  
308 CC X-230. Y+230.  
309 C X-230. Y+263.77 DR-  
310 L X+230. Y+263.77  
311 CC X+230. Y+230.  
312 C X+263.77 Y+230. DR-  
313 L X+263.77 Y+20.  
314 CC X+230. Y+20.  
315 C X+230. Y-13.77 DR-  
316 L X-230. Y-13.77  
317 L Y-12.75  
318 CC X-230. Y+20.  
319 C X-262.75 Y+20. DR-  
320 L X-262.75 Y+230.  
321 CC X-230. Y+230.  
322 C X-230. Y+262.75 DR-  
323 L X+230. Y+262.75  
324 CC X+230. Y+230.  
325 C X+262.75 Y+230. DR-  
326 L X+262.75 Y+20.  
327 CC X+230. Y+20.  
328 C X+230. Y-12.75 DR-  
329 L X-230. Y-12.75  
330 L Y-13.77  
331 FQ1  
332 L Z+5.  
333 Q22 = Q2\*1.  
334 FQ22  
335 CC X-230. Y+20.  
336 C X-263.77 Y+20. DR-  
337 L X-263.77 Y+230.  
338 CC X-230. Y+230.  
339 C X-230. Y+263.77 DR-  
340 L X+230. Y+263.77  
341 CC X+230. Y+230.  
342 C X+263.77 Y+230. DR-  
343 L X+263.77 Y+20.  
344 CC X+230. Y+20.  
345 C X+230. Y-13.77 DR-  
346 L X-230. Y-13.77

347 L Y-12.75  
348 CC X-230. Y+20.  
349 C X-262.75 Y+20. DR-  
350 L X-262.75 Y+230.  
351 CC X-230. Y+230.  
352 C X-230. Y+262.75 DR-  
353 L X+230. Y+262.75  
354 CC X+230. Y+230.  
355 C X+262.75 Y+230. DR-  
356 L X+262.75 Y+20.  
357 CC X+230. Y+20.  
358 C X+230. Y-12.75 DR-  
359 L X-230. Y-12.75  
360 L Y-13.77  
361 FQ1  
362 L Z+0  
363 Q22 = Q2\*1.  
364 FQ22  
365 CC X-230. Y+20.  
366 C X-263.77 Y+20. DR-  
367 L X-263.77 Y+230.  
368 CC X-230. Y+230.  
369 C X-230. Y+263.77 DR-  
370 L X+230. Y+263.77  
371 CC X+230. Y+230.  
372 C X+263.77 Y+230. DR-  
373 L X+263.77 Y+20.  
374 CC X+230. Y+20.  
375 C X+230. Y-13.77 DR-  
376 L X-230. Y-13.77  
377 L Y-12.75  
378 CC X-230. Y+20.  
379 C X-262.75 Y+20. DR-  
380 L X-262.75 Y+230.  
381 CC X-230. Y+230.  
382 C X-230. Y+262.75 DR-  
383 L X+230. Y+262.75  
384 CC X+230. Y+230.  
385 C X+262.75 Y+230. DR-  
386 L X+262.75 Y+20.  
387 CC X+230. Y+20.  
388 C X+230. Y-12.75 DR-  
389 L X-230. Y-12.75  
390 L Z+60. FMAX  
391 L Z+60. R0 FMAX  
392 M9  
393 ; T416 FREZA CTVRTKOVA - PRUM 20./ ROHOVY RADIUS 1.5  
394 ; -- DEFINICE POSUVU PRO NASTROJ  
395 FN 0: Q1 = 120.3211 ;(ZAPICHOVACI POSUV)  
396 FN 0: Q2 = 240.6423 ;(PRACOVNI POSUV)  
397 FN 0: Q3 = 20000 ;(PLYNULY RYCHLOPOSUV)  
398 TOOL CALL 416 Z S477  
399 L M6  
400 L Z+60. R0 FMAX M8  
401 L X+6.336 Y+134.539 FMAX M3  
402 L Z+55. FMAX  
403 FQ1  
404 L Z+42.  
405 Q22 = Q2\*1.  
406 FQ22  
407 L X+10.014 Y+134.367  
408 L X+19.251 Y+135.64  
409 L X+8.936 Y+139.092  
410 L X-4.86 Y+142.547  
411 L X-17.198 Y+144.61



412 L X-26.742 Y+145.341  
413 L X-32.314 Y+144.911  
414 L X-29.828 Y+143.341  
415 L X-23.177 Y+140.207  
416 L X-16.702 Y+137.957  
417 L X-9.84 Y+136.36  
418 L X+6.336 Y+134.539  
419 L X+5.697 Y+126.561  
420 L X+5.7 Y+126.56  
421 L X+10.328 Y+126.344  
422 L X+18.502 Y+127.369  
423 L X+45.773 Y+132.373  
424 L X+36.529 Y+137.228  
425 L X+24.904 Y+142.184  
426 L X+11.181 Y+146.777  
427 L X-3.226 Y+150.385  
428 L X-16.23 Y+152.559  
429 L X-26.556 Y+153.351  
430 L X-31.828 Y+153.191  
431 L X-35.556 Y+152.401  
432 L X-38.983 Y+150.368  
433 L X-42.909 Y+146.964  
434 L X-45.732 Y+143.921  
435 L X-33.683 Y+136.314  
436 L X-26.203 Y+132.789  
437 L X-18.927 Y+130.261  
438 L X-11.199 Y+128.463  
439 L X+5.697 Y+126.561  
440 L X+5.059 Y+118.582  
441 L X+5.066 Y+118.581  
442 L X+10.641 Y+118.32  
443 L X+19.723 Y+119.46  
444 L X+59.6 Y+126.777  
445 L X+69.386 Y+127.823  
446 L X+53.84 Y+137.172  
447 L X+39.964 Y+144.46  
448 L X+27.746 Y+149.669  
449 L X+13.425 Y+154.462  
450 L X-1.592 Y+158.222  
451 L X-15.263 Y+160.508  
452 L X-26.371 Y+161.36  
453 L X-32.786 Y+161.166  
454 L X-38.505 Y+159.954  
455 L X-43.682 Y+156.882  
456 L X-48.479 Y+152.723  
457 L X-54.165 Y+146.594  
458 L X-57.124 Y+142.575  
459 L X-48.481 Y+135.948  
460 L X-37.477 Y+129.258  
461 L X-29.23 Y+125.371  
462 L X-21.152 Y+122.565  
463 L X-12.557 Y+120.565  
464 L X+5.059 Y+118.582  
465 L X+4.421 Y+110.603  
466 L X+4.431 Y+110.602  
467 L X+10.954 Y+110.297  
468 L X+20.944 Y+111.55  
469 L X+60.748 Y+118.854  
470 L X+81.949 Y+121.121  
471 L X+94.867 Y+121.834  
472 L X+57.765 Y+144.147  
473 L X+43.398 Y+151.693  
474 L X+30.589 Y+157.154  
475 L X+15.67 Y+162.147  
476 L X+0.042 Y+166.06

477 L X-14.295 Y+168.458  
478 L X-26.185 Y+169.369  
479 L X-33.532 Y+169.147  
480 L X-38.221 Y+168.409  
481 L X-41.431 Y+167.424  
482 L X-44.661 Y+165.868  
483 L X-48.555 Y+163.245  
484 L X-54.048 Y+158.483  
485 L X-60.338 Y+151.703  
486 L X-67.806 Y+141.561  
487 L X-61.669 Y+135.882  
488 L X-52.981 Y+129.321  
489 L X-41.271 Y+122.202  
490 L X-32.256 Y+117.954  
491 L X-23.378 Y+114.869  
492 L X-13.916 Y+112.668  
493 L X+4.421 Y+110.603  
494 L X+3.782 Y+102.624  
495 L X+3.796 Y+102.623  
496 L X+11.268 Y+102.274  
497 L X+22.164 Y+103.641  
498 L X+61.897 Y+110.931  
499 L X+82.596 Y+113.145  
500 L X+115.409 Y+114.956  
501 L X+121.171 Y+115.808  
502 L X+92.438 Y+132.496  
503 L X+61.701 Y+151.116  
504 L X+46.833 Y+158.926  
505 L X+33.432 Y+164.639  
506 L X+17.914 Y+169.832  
507 L X+1.675 Y+173.898  
508 L X-13.328 Y+176.407  
509 L X-26. Y+177.378  
510 L X-34.277 Y+177.128  
511 L X-40.025 Y+176.223  
512 L X-44.356 Y+174.895  
513 L X-48.653 Y+172.825  
514 L X-53.428 Y+169.608  
515 L X-59.617 Y+164.243  
516 L X-66.497 Y+156.826  
517 L X-74.212 Y+146.458  
518 L X-77.562 Y+140.706  
519 L X-73.605 Y+136.028  
520 L X-66.809 Y+129.738  
521 L X-57.48 Y+122.695  
522 L X-45.065 Y+115.146  
523 L X-35.282 Y+110.536  
524 L X-25.604 Y+107.173  
525 L X-15.275 Y+104.77  
526 L X+3.782 Y+102.624  
527 L X+3.144 Y+94.646  
528 L X+3.161 Y+94.644  
529 L X+11.581 Y+94.25  
530 L X+23.385 Y+95.731  
531 L X+63.046 Y+103.008  
532 L X+83.242 Y+105.168  
533 L X+116.216 Y+106.989  
534 L X+125.631 Y+108.38  
535 L X+131.65 Y+110.051  
536 L X+135.993 Y+111.999  
537 L X+139.494 Y+114.417  
538 L X+96.52 Y+139.377  
539 L X+65.637 Y+158.085  
540 L X+50.267 Y+166.158  
541 L X+36.275 Y+172.123

542 L X+20.159 Y+177.517  
543 L X+3.309 Y+181.736  
544 L X-12.361 Y+184.356  
545 L X-25.815 Y+185.388  
546 L X-35.023 Y+185.109  
547 L X-41.829 Y+184.038  
548 L X-47.282 Y+182.365  
549 L X-52.644 Y+179.782  
550 L X-58.301 Y+175.971  
551 L X-65.186 Y+170.002  
552 L X-72.656 Y+161.949  
553 L X-80.89 Y+150.885  
554 L X-84.813 Y+144.206  
555 L X-86.366 Y+139.761  
556 L X-83.899 Y+135.736  
557 L X-79.376 Y+130.468  
558 L X-71.949 Y+123.595  
559 L X-61.98 Y+116.068  
560 L X-48.858 Y+108.09  
561 L X-38.309 Y+103.118  
562 L X-27.829 Y+99.478  
563 L X-16.633 Y+96.872  
564 L X+3.144 Y+94.646  
565 L X+2.506 Y+86.671  
566 L X+2.677 Y+86.658  
567 L X+11.894 Y+86.227  
568 L X+24.606 Y+87.821  
569 L X+64.195 Y+95.086  
570 L X+83.888 Y+97.192  
571 L X+117.023 Y+99.021  
572 L X+127.292 Y+100.539  
573 L X+134.372 Y+102.504  
574 L X+139.937 Y+104.999  
575 L X+146.816 Y+109.753  
576 L X+151.918 Y+115.258  
577 L X+145.541 Y+120.157  
578 L X+100.602 Y+146.258  
579 L X+69.573 Y+165.054  
580 L X+53.701 Y+173.391  
581 L X+39.118 Y+179.608  
582 L X+22.403 Y+185.202  
583 L X+4.943 Y+189.574  
584 L X-11.393 Y+192.306  
585 L X-25.629 Y+193.397  
586 L X-35.769 Y+193.09  
587 L X-43.633 Y+191.852  
588 L X-50.208 Y+189.836  
589 L X-56.635 Y+186.739  
590 L X-63.174 Y+182.335  
591 L X-70.755 Y+175.762  
592 L X-78.816 Y+167.073  
593 L X-87.568 Y+155.312  
594 L X-92.043 Y+147.693  
595 L X-94.224 Y+142.034  
596 L X-94.479 Y+138.993  
597 L X-93.741 Y+136.485  
598 L X-90.385 Y+131.01  
599 L X-85.147 Y+124.908  
600 L X-77.089 Y+117.452  
601 L X-66.48 Y+109.441  
602 L X-52.652 Y+101.034  
603 L X-41.335 Y+95.701  
604 L X-30.054 Y+91.782  
605 L X-18.065 Y+88.992  
606 L X-4.241 Y+87.172

607 L X+2.506 Y+86.671  
608 L X+1.868 Y+78.696  
609 L X+2.193 Y+78.672  
610 L X+12.208 Y+78.203  
611 L X+25.827 Y+79.912  
612 L X+65.344 Y+87.163  
613 L X+84.535 Y+89.215  
614 L X+117.83 Y+91.053  
615 L X+128.953 Y+92.697  
616 L X+137.094 Y+94.957  
617 L X+143.881 Y+98.  
618 L X+152.032 Y+103.633  
619 L X+158.051 Y+109.918  
620 L X+160.907 Y+114.723  
621 L X+161.424 Y+116.733  
622 L X+158.441 Y+120.335  
623 L X+150.045 Y+126.785  
624 L X+136.47 Y+134.898  
625 L X+104.666 Y+153.15  
626 L X+73.509 Y+172.023  
627 L X+57.136 Y+180.623  
628 L X+41.96 Y+187.093  
629 L X+24.648 Y+192.887  
630 L X+6.577 Y+197.412  
631 L X-10.426 Y+200.255  
632 L X-25.444 Y+201.406  
633 L X-36.515 Y+201.071  
634 L X-45.437 Y+199.667  
635 L X-53.133 Y+197.306  
636 L X-60.627 Y+193.697  
637 L X-68.047 Y+188.698  
638 L X-76.325 Y+181.521  
639 L X-84.975 Y+172.196  
640 L X-94.246 Y+159.739  
641 L X-99.272 Y+151.181  
642 L X-102.101 Y+143.843  
643 L X-102.576 Y+138.17  
644 L X-101.117 Y+133.209  
645 L X-96.872 Y+126.284  
646 L X-90.917 Y+119.349  
647 L X-82.229 Y+111.308  
648 L X-70.98 Y+102.814  
649 L X-56.446 Y+93.978  
650 L X-44.361 Y+88.283  
651 L X-32.28 Y+84.086  
652 L X-19.497 Y+81.111  
653 L X-5.061 Y+79.211  
654 L X+1.868 Y+78.696  
655 L X+1.23 Y+70.729  
656 L X+1.243 Y+70.728  
657 L X+4.142 Y+70.388  
658 L X+6.814 Y+70.203  
659 L X+9.6 Y+70.142  
660 L X+12.56 Y+70.209  
661 L X+15.742 Y+70.417  
662 L X+18.707 Y+70.724  
663 L X+22.426 Y+71.236  
664 L X+27.219 Y+72.034  
665 L X+33.746 Y+73.255  
666 L X+44.52 Y+75.378  
667 L X+52.052 Y+76.821  
668 L X+59.558 Y+78.153  
669 L X+66.496 Y+79.246  
670 L X+72.939 Y+80.107  
671 L X+79.002 Y+80.755

672 L X+85.072 Y+81.233  
673 L X+92.172 Y+81.63  
674 L X+107.823 Y+82.317  
675 L X+113.591 Y+82.667  
676 L X+118.621 Y+83.092  
677 L X+123.045 Y+83.598  
678 L X+127.005 Y+84.189  
679 L X+130.599 Y+84.866  
680 L X+133.895 Y+85.631  
681 L X+136.946 Y+86.483  
682 L X+139.79 Y+87.422  
683 L X+142.444 Y+88.446  
684 L X+145.304 Y+89.73  
685 L X+147.737 Y+90.988  
686 L X+150.194 Y+92.422  
687 L X+152.624 Y+94.011  
688 L X+154.983 Y+95.73  
689 L X+157.224 Y+97.543  
690 L X+159.312 Y+99.418  
691 L X+161.221 Y+101.322  
692 L X+162.932 Y+103.221  
693 L X+164.432 Y+105.087  
694 L X+165.716 Y+106.89  
695 L X+166.786 Y+108.606  
696 L X+167.65 Y+110.215  
697 L X+168.32 Y+111.701  
698 L X+168.814 Y+113.052  
699 L X+169.152 Y+114.262  
700 L X+169.358 Y+115.332  
701 L X+169.455 Y+116.267  
702 L X+169.464 Y+117.078  
703 L X+169.385 Y+117.965  
704 L X+169.204 Y+118.745  
705 L X+168.962 Y+119.466  
706 L X+168.604 Y+120.277  
707 L X+168.101 Y+121.196  
708 L X+167.419 Y+122.233  
709 L X+166.526 Y+123.398  
710 L X+165.387 Y+124.695  
711 L X+163.962 Y+126.129  
712 L X+162.213 Y+127.707  
713 L X+160.089 Y+129.44  
714 L X+157.534 Y+131.345  
715 L X+154.465 Y+133.454  
716 L X+150.765 Y+135.818  
717 L X+146.227 Y+138.541  
718 L X+140.395 Y+141.869  
719 L X+124.667 Y+150.608  
720 L X+117.238 Y+154.918  
721 L X+108.826 Y+159.983  
722 L X+91.174 Y+170.852  
723 L X+83.975 Y+175.191  
724 L X+77.461 Y+178.979  
725 L X+71.504 Y+182.283  
726 L X+65.92 Y+185.213  
727 L X+60.576 Y+187.846  
728 L X+55.62 Y+190.127  
729 L X+50.343 Y+192.382  
730 L X+44.801 Y+194.572  
731 L X+39.02 Y+196.68  
732 L X+33.034 Y+198.686  
733 L X+26.891 Y+200.567  
734 L X+20.664 Y+202.299  
735 L X+14.408 Y+203.865  
736 L X+8.211 Y+205.244

737 L X+2.133 Y+206.428  
738 L X-3.77 Y+207.412  
739 L X-9.448 Y+208.196  
740 L X-14.847 Y+208.781  
741 L X-20.626 Y+209.217  
742 L X-25.257 Y+209.405  
743 L X-29.544 Y+209.431  
744 L X-33.528 Y+209.305  
745 L X-37.252 Y+209.039  
746 L X-40.756 Y+208.641  
747 L X-44.073 Y+208.115  
748 L X-47.233 Y+207.465  
749 L X-50.264 Y+206.691  
750 L X-53.192 Y+205.792  
751 L X-56.039 Y+204.763  
752 L X-58.823 Y+203.598  
753 L X-61.534 Y+202.304  
754 L X-64.615 Y+200.634  
755 L X-67.283 Y+199.011  
756 L X-70.057 Y+197.148  
757 L X-72.915 Y+195.048  
758 L X-75.847 Y+192.705  
759 L X-78.844 Y+190.113  
760 L X-81.888 Y+187.272  
761 L X-84.964 Y+184.186  
762 L X-88.05 Y+180.864  
763 L X-91.109 Y+177.333  
764 L X-94.11 Y+173.625  
765 L X-97.017 Y+169.776  
766 L X-99.824 Y+165.79  
767 L X-100.95 Y+164.106  
768 L X-103.162 Y+160.619  
769 L X-104.961 Y+157.538  
770 L X-106.432 Y+154.755  
771 L X-107.624 Y+152.218  
772 L X-108.576 Y+149.892  
773 L X-109.317 Y+147.745  
774 L X-109.874 Y+145.753  
775 L X-110.269 Y+143.893  
776 L X-110.521 Y+142.141  
777 L X-110.643 Y+140.476  
778 L X-110.646 Y+138.873  
779 L X-110.535 Y+137.309  
780 L X-110.31 Y+135.765  
781 L X-109.958 Y+134.169  
782 L X-109.698 Y+133.256  
783 L X-109.124 Y+131.608  
784 L X-108.392 Y+129.875  
785 L X-107.462 Y+127.996  
786 L X-106.313 Y+125.972  
787 L X-104.926 Y+123.804  
788 L X-103.284 Y+121.496  
789 L X-101.371 Y+119.053  
790 L X-99.172 Y+116.482  
791 L X-96.676 Y+113.794  
792 L X-93.877 Y+111.001  
793 L X-90.771 Y+108.119  
794 L X-87.362 Y+105.171  
795 L X-83.662 Y+102.18  
796 L X-79.693 Y+99.179  
797 L X-75.498 Y+96.211  
798 L X-71.143 Y+93.33  
799 L X-66.655 Y+90.558  
800 L X-64.647 Y+89.381  
801 L X-60.214 Y+86.92

802 L X-55.899 Y+84.706  
803 L X-51.633 Y+82.698  
804 L X-47.386 Y+80.875  
805 L X-43.129 Y+79.225  
806 L X-38.84 Y+77.735  
807 L X-34.499 Y+76.398  
808 L X-30.088 Y+75.209  
809 L X-25.573 Y+74.157  
810 L X-20.92 Y+73.238  
811 L X-16.094 Y+72.446  
812 L X-11.052 Y+71.78  
813 L X-5.759 Y+71.241  
814 L X+1.23 Y+70.729  
815 L X+1.167 Y+69.932  
816 L X+4.067 Y+69.591  
817 L X+6.777 Y+69.404  
818 L X+9.601 Y+69.342  
819 L X+12.595 Y+69.41  
820 L X+15.809 Y+69.62  
821 L X+18.803 Y+69.93  
822 L X+22.546 Y+70.445  
823 L X+27.358 Y+71.246  
824 L X+33.897 Y+72.469  
825 L X+44.673 Y+74.593  
826 L X+52.197 Y+76.034  
827 L X+59.69 Y+77.364  
828 L X+66.611 Y+78.454  
829 L X+73.034 Y+79.312  
830 L X+79.076 Y+79.958  
831 L X+85.126 Y+80.434  
832 L X+92.212 Y+80.831  
833 L X+107.864 Y+81.518  
834 L X+113.648 Y+81.869  
835 L X+118.7 Y+82.296  
836 L X+123.15 Y+82.804  
837 L X+127.138 Y+83.4  
838 L X+130.763 Y+84.083  
839 L X+134.093 Y+84.856  
840 L X+137.179 Y+85.717  
841 L X+140.06 Y+86.669  
842 L X+142.752 Y+87.707  
843 L X+145.652 Y+89.01  
844 L X+148.122 Y+90.287  
845 L X+150.615 Y+91.742  
846 L X+153.079 Y+93.353  
847 L X+155.47 Y+95.095  
848 L X+157.743 Y+96.934  
849 L X+159.862 Y+98.837  
850 L X+161.801 Y+100.77  
851 L X+163.541 Y+102.703  
852 L X+165.07 Y+104.604  
853 L X+166.382 Y+106.446  
854 L X+167.479 Y+108.205  
855 L X+168.367 Y+109.861  
856 L X+169.061 Y+111.398  
857 L X+169.576 Y+112.806  
858 L X+169.932 Y+114.078  
859 L X+170.151 Y+115.215  
860 L X+170.255 Y+116.221  
861 L X+170.265 Y+117.109  
862 L X+170.177 Y+118.092  
863 L X+169.975 Y+118.963  
864 L X+169.709 Y+119.756  
865 L X+169.322 Y+120.631  
866 L X+168.787 Y+121.608

867 L X+168.072 Y+122.697  
868 L X+167.145 Y+123.906  
869 L X+165.971 Y+125.241  
870 L X+164.514 Y+126.708  
871 L X+162.734 Y+128.314  
872 L X+160.582 Y+130.07  
873 L X+157.999 Y+131.996  
874 L X+154.907 Y+134.121  
875 L X+151.186 Y+136.498  
876 L X+146.631 Y+139.232  
877 L X+140.788 Y+142.566  
878 L X+125.062 Y+151.304  
879 L X+117.646 Y+155.607  
880 L X+109.242 Y+160.666  
881 L X+91.59 Y+171.535  
882 L X+84.383 Y+175.88  
883 L X+77.856 Y+179.675  
884 L X+71.884 Y+182.987  
885 L X+66.283 Y+185.927  
886 L X+60.92 Y+188.569  
887 L X+55.944 Y+190.858  
888 L X+50.647 Y+193.122  
889 L X+45.086 Y+195.32  
890 L X+39.284 Y+197.435  
891 L X+33.278 Y+199.447  
892 L X+27.116 Y+201.335  
893 L X+20.868 Y+203.072  
894 L X+14.592 Y+204.643  
895 L X+8.375 Y+206.027  
896 L X+2.276 Y+207.215  
897 L X-3.649 Y+208.203  
898 L X-9.35 Y+208.99  
899 L X-14.774 Y+209.577  
900 L X-20.58 Y+210.015  
901 L X-25.239 Y+210.205  
902 L X-29.555 Y+210.231  
903 L X-33.569 Y+210.104  
904 L X-37.326 Y+209.836  
905 L X-40.864 Y+209.434  
906 L X-44.216 Y+208.902  
907 L X-47.413 Y+208.245  
908 L X-50.481 Y+207.462  
909 L X-53.445 Y+206.551  
910 L X-56.329 Y+205.508  
911 L X-59.15 Y+204.328  
912 L X-61.897 Y+203.018  
913 L X-65.014 Y+201.328  
914 L X-67.714 Y+199.685  
915 L X-70.517 Y+197.803  
916 L X-73.402 Y+195.684  
917 L X-76.359 Y+193.32  
918 L X-79.378 Y+190.708  
919 L X-82.445 Y+187.847  
920 L X-85.541 Y+184.74  
921 L X-88.645 Y+181.398  
922 L X-91.723 Y+177.847  
923 L X-94.74 Y+174.118  
924 L X-97.663 Y+170.247  
925 L X-100.484 Y+166.242  
926 L X-101.62 Y+164.542  
927 L X-103.845 Y+161.035  
928 L X-105.66 Y+157.927  
929 L X-107.148 Y+155.112  
930 L X-108.357 Y+152.54  
931 L X-109.325 Y+150.174



932 L X-110.081 Y+147.984  
933 L X-110.651 Y+145.944  
934 L X-111.057 Y+144.033  
935 L X-111.316 Y+142.228  
936 L X-111.443 Y+140.506  
937 L X-111.446 Y+138.846  
938 L X-111.331 Y+137.223  
939 L X-111.098 Y+135.621  
940 L X-110.734 Y+133.973  
941 L X-110.461 Y+133.014  
942 L X-109.871 Y+131.321  
943 L X-109.12 Y+129.541  
944 L X-108.169 Y+127.621  
945 L X-106.998 Y+125.559  
946 L X-105.589 Y+123.357  
947 L X-103.925 Y+121.017  
948 L X-101.99 Y+118.546  
949 L X-99.769 Y+115.95  
950 L X-97.252 Y+113.238  
951 L X-94.432 Y+110.424  
952 L X-91.305 Y+107.523  
953 L X-87.875 Y+104.557  
954 L X-84.155 Y+101.55  
955 L X-80.165 Y+98.533  
956 L X-75.95 Y+95.551  
957 L X-71.574 Y+92.656  
958 L X-67.068 Y+89.873  
959 L X-65.044 Y+88.686  
960 L X-60.591 Y+86.214  
961 L X-56.252 Y+83.988  
962 L X-51.961 Y+81.968  
963 L X-47.688 Y+80.135  
964 L X-43.404 Y+78.473  
965 L X-39.089 Y+76.975  
966 L X-34.721 Y+75.63  
967 L X-30.282 Y+74.433  
968 L X-25.741 Y+73.375  
969 L X-21.063 Y+72.451  
970 L X-16.211 Y+71.655  
971 L X-11.145 Y+70.986  
972 L X-5.828 Y+70.444  
973 L X+1.167 Y+69.932  
974 L Z+60. FMAX  
975 L X+6.336 Y+134.539 FMAX  
976 L Z+47. FMAX  
977 FQ1  
978 L Z+34.  
979 Q22 = Q2\*1.  
980 FQ22  
981 L X+10.014 Y+134.367  
982 L X+19.251 Y+135.64  
983 L X+8.936 Y+139.092  
984 L X-4.86 Y+142.547  
985 L X-17.198 Y+144.61  
986 L X-26.742 Y+145.341  
987 L X-32.314 Y+144.911  
988 L X-29.828 Y+143.341  
989 L X-23.177 Y+140.207  
990 L X-16.702 Y+137.957  
991 L X-9.84 Y+136.36  
992 L X+6.336 Y+134.539  
993 L X+5.697 Y+126.561  
994 L X+5.7 Y+126.56  
995 L X+10.328 Y+126.344  
996 L X+18.502 Y+127.369

997 L X+45.773 Y+132.373  
998 L X+36.529 Y+137.228  
999 L X+24.904 Y+142.184  
1000 L X+11.181 Y+146.777  
1001 L X-3.226 Y+150.385  
1002 L X-16.23 Y+152.559  
1003 L X-26.556 Y+153.351  
1004 L X-31.828 Y+153.191  
1005 L X-35.556 Y+152.401  
1006 L X-38.983 Y+150.368  
1007 L X-42.909 Y+146.964  
1008 L X-45.732 Y+143.921  
1009 L X-33.683 Y+136.314  
1010 L X-26.203 Y+132.789  
1011 L X-18.927 Y+130.261  
1012 L X-11.199 Y+128.463  
1013 L X+5.697 Y+126.561  
1014 L X+5.059 Y+118.582  
1015 L X+5.066 Y+118.581  
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1017 L X+19.723 Y+119.46  
1018 L X+59.6 Y+126.777  
1019 L X+69.386 Y+127.823  
1020 L X+53.84 Y+137.172  
1021 L X+39.964 Y+144.46  
1022 L X+27.746 Y+149.669  
1023 L X+13.425 Y+154.462  
1024 L X-1.592 Y+158.222  
1025 L X-15.263 Y+160.508  
1026 L X-26.371 Y+161.36  
1027 L X-32.786 Y+161.166  
1028 L X-38.505 Y+159.954  
1029 L X-43.682 Y+156.882  
1030 L X-48.479 Y+152.723  
1031 L X-54.165 Y+146.594  
1032 L X-57.124 Y+142.575  
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1034 L X-37.477 Y+129.258  
1035 L X-29.23 Y+125.371  
1036 L X-21.152 Y+122.565  
1037 L X-12.557 Y+120.565  
1038 L X+5.059 Y+118.582  
1039 L X+4.421 Y+110.603  
1040 L X+4.431 Y+110.602  
1041 L X+10.954 Y+110.297  
1042 L X+20.944 Y+111.55  
1043 L X+60.748 Y+118.854  
1044 L X+81.949 Y+121.121  
1045 L X+94.867 Y+121.834  
1046 L X+57.765 Y+144.147  
1047 L X+43.398 Y+151.693  
1048 L X+30.589 Y+157.154  
1049 L X+15.67 Y+162.147  
1050 L X+0.042 Y+166.06  
1051 L X-14.295 Y+168.458  
1052 L X-26.185 Y+169.369  
1053 L X-33.532 Y+169.147  
1054 L X-38.221 Y+168.409  
1055 L X-41.431 Y+167.424  
1056 L X-44.661 Y+165.868  
1057 L X-48.555 Y+163.245  
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1060 L X-67.806 Y+141.561  
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1062 L X-52.981 Y+129.321  
1063 L X-41.271 Y+122.202  
1064 L X-32.256 Y+117.954  
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1066 L X-13.916 Y+112.668  
1067 L X+4.421 Y+110.603  
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1069 L X+3.796 Y+102.623  
1070 L X+11.268 Y+102.274  
1071 L X+22.164 Y+103.641  
1072 L X+61.897 Y+110.931  
1073 L X+82.596 Y+113.145  
1074 L X+115.409 Y+114.956  
1075 L X+121.171 Y+115.808  
1076 L X+92.438 Y+132.496  
1077 L X+61.701 Y+151.116  
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1079 L X+33.432 Y+164.639  
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1083 L X-26. Y+177.378  
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1087 L X-48.653 Y+172.825  
1088 L X-53.428 Y+169.608  
1089 L X-59.617 Y+164.243  
1090 L X-66.497 Y+156.826  
1091 L X-74.212 Y+146.458  
1092 L X-77.562 Y+140.706  
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1094 L X-66.809 Y+129.738  
1095 L X-57.48 Y+122.695  
1096 L X-45.065 Y+115.146  
1097 L X-35.282 Y+110.536  
1098 L X-25.604 Y+107.173  
1099 L X-15.275 Y+104.77  
1100 L X+3.782 Y+102.624  
1101 L X+3.144 Y+94.646  
1102 L X+3.161 Y+94.644  
1103 L X+11.581 Y+94.25  
1104 L X+23.385 Y+95.731  
1105 L X+63.046 Y+103.008  
1106 L X+83.242 Y+105.168  
1107 L X+116.216 Y+106.989  
1108 L X+125.631 Y+108.38  
1109 L X+131.65 Y+110.051  
1110 L X+135.993 Y+111.999  
1111 L X+139.494 Y+114.417  
1112 L X+96.52 Y+139.377  
1113 L X+65.637 Y+158.085  
1114 L X+50.267 Y+166.158  
1115 L X+36.275 Y+172.123  
1116 L X+20.159 Y+177.517  
1117 L X+3.309 Y+181.736  
1118 L X-12.361 Y+184.356  
1119 L X-25.815 Y+185.388  
1120 L X-35.023 Y+185.109  
1121 L X-41.829 Y+184.038  
1122 L X-47.282 Y+182.365  
1123 L X-52.644 Y+179.782  
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1125 L X-65.186 Y+170.002  
1126 L X-72.656 Y+161.949

1127 L X-80.89 Y+150.885  
1128 L X-84.813 Y+144.206  
1129 L X-86.366 Y+139.761  
1130 L X-83.899 Y+135.736  
1131 L X-79.376 Y+130.468  
1132 L X-71.949 Y+123.595  
1133 L X-61.98 Y+116.068  
1134 L X-48.858 Y+108.09  
1135 L X-38.309 Y+103.118  
1136 L X-27.829 Y+99.478  
1137 L X-16.633 Y+96.872  
1138 L X+3.144 Y+94.646  
1139 L X+2.506 Y+86.671  
1140 L X+2.677 Y+86.658  
1141 L X+11.894 Y+86.227  
1142 L X+24.606 Y+87.821  
1143 L X+64.195 Y+95.086  
1144 L X+83.888 Y+97.192  
1145 L X+117.023 Y+99.021  
1146 L X+127.292 Y+100.539  
1147 L X+134.372 Y+102.504  
1148 L X+139.937 Y+104.999  
1149 L X+146.816 Y+109.753  
1150 L X+151.918 Y+115.258  
1151 L X+145.541 Y+120.157  
1152 L X+100.602 Y+146.258  
1153 L X+69.573 Y+165.054  
1154 L X+53.701 Y+173.391  
1155 L X+39.118 Y+179.608  
1156 L X+22.403 Y+185.202  
1157 L X+4.943 Y+189.574  
1158 L X-11.393 Y+192.306  
1159 L X-25.629 Y+193.397  
1160 L X-35.769 Y+193.09  
1161 L X-43.633 Y+191.852  
1162 L X-50.208 Y+189.836  
1163 L X-56.635 Y+186.739  
1164 L X-63.174 Y+182.335  
1165 L X-70.755 Y+175.762  
1166 L X-78.816 Y+167.073  
1167 L X-87.568 Y+155.312  
1168 L X-92.043 Y+147.693  
1169 L X-94.224 Y+142.034  
1170 L X-94.479 Y+138.993  
1171 L X-93.741 Y+136.485  
1172 L X-90.385 Y+131.01  
1173 L X-85.147 Y+124.908  
1174 L X-77.089 Y+117.452  
1175 L X-66.48 Y+109.441  
1176 L X-52.652 Y+101.034  
1177 L X-41.335 Y+95.701  
1178 L X-30.054 Y+91.782  
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1180 L X-4.241 Y+87.172  
1181 L X+2.506 Y+86.671  
1182 L X+1.868 Y+78.696  
1183 L X+2.193 Y+78.672  
1184 L X+12.208 Y+78.203  
1185 L X+25.827 Y+79.912  
1186 L X+65.344 Y+87.163  
1187 L X+84.535 Y+89.215  
1188 L X+117.83 Y+91.053  
1189 L X+128.953 Y+92.697  
1190 L X+137.094 Y+94.957  
1191 L X+143.881 Y+98.

1192 L X+152.032 Y+103.633  
1193 L X+158.051 Y+109.918  
1194 L X+160.907 Y+114.723  
1195 L X+161.424 Y+116.733  
1196 L X+158.441 Y+120.335  
1197 L X+150.045 Y+126.785  
1198 L X+136.47 Y+134.898  
1199 L X+104.666 Y+153.15  
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1201 L X+57.136 Y+180.623  
1202 L X+41.96 Y+187.093  
1203 L X+24.648 Y+192.887  
1204 L X+6.577 Y+197.412  
1205 L X-10.426 Y+200.255  
1206 L X-25.444 Y+201.406  
1207 L X-36.515 Y+201.071  
1208 L X-45.437 Y+199.667  
1209 L X-53.133 Y+197.306  
1210 L X-60.627 Y+193.697  
1211 L X-68.047 Y+188.698  
1212 L X-76.325 Y+181.521  
1213 L X-84.975 Y+172.196  
1214 L X-94.246 Y+159.739  
1215 L X-99.272 Y+151.181  
1216 L X-102.101 Y+143.843  
1217 L X-102.576 Y+138.17  
1218 L X-101.117 Y+133.209  
1219 L X-96.872 Y+126.284  
1220 L X-90.917 Y+119.349  
1221 L X-82.229 Y+111.308  
1222 L X-70.98 Y+102.814  
1223 L X-56.446 Y+93.978  
1224 L X-44.361 Y+88.283  
1225 L X-32.28 Y+84.086  
1226 L X-19.497 Y+81.111  
1227 L X-5.061 Y+79.211  
1228 L X+1.868 Y+78.696  
1229 L X+1.23 Y+70.729  
1230 L X+1.243 Y+70.728  
1231 L X+4.142 Y+70.388  
1232 L X+6.814 Y+70.203  
1233 L X+9.6 Y+70.142  
1234 L X+12.56 Y+70.209  
1235 L X+15.742 Y+70.417  
1236 L X+18.707 Y+70.724  
1237 L X+22.426 Y+71.236  
1238 L X+27.219 Y+72.034  
1239 L X+33.746 Y+73.255  
1240 L X+44.52 Y+75.378  
1241 L X+52.052 Y+76.821  
1242 L X+59.558 Y+78.153  
1243 L X+66.496 Y+79.246  
1244 L X+72.939 Y+80.107  
1245 L X+79.002 Y+80.755  
1246 L X+85.072 Y+81.233  
1247 L X+92.172 Y+81.63  
1248 L X+107.823 Y+82.317  
1249 L X+113.591 Y+82.667  
1250 L X+118.621 Y+83.092  
1251 L X+123.045 Y+83.598  
1252 L X+127.005 Y+84.189  
1253 L X+130.599 Y+84.866  
1254 L X+133.895 Y+85.631  
1255 L X+136.946 Y+86.483  
1256 L X+139.79 Y+87.422

1257 L X+142.444 Y+88.446  
1258 L X+145.304 Y+89.73  
1259 L X+147.737 Y+90.988  
1260 L X+150.194 Y+92.422  
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1262 L X+154.983 Y+95.73  
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1264 L X+159.312 Y+99.418  
1265 L X+161.221 Y+101.322  
1266 L X+162.932 Y+103.221  
1267 L X+164.432 Y+105.087  
1268 L X+165.716 Y+106.89  
1269 L X+166.786 Y+108.606  
1270 L X+167.65 Y+110.215  
1271 L X+168.32 Y+111.701  
1272 L X+168.814 Y+113.052  
1273 L X+169.152 Y+114.262  
1274 L X+169.358 Y+115.332  
1275 L X+169.455 Y+116.267  
1276 L X+169.464 Y+117.078  
1277 L X+169.385 Y+117.965  
1278 L X+169.204 Y+118.745  
1279 L X+168.962 Y+119.466  
1280 L X+168.604 Y+120.277  
1281 L X+168.101 Y+121.196  
1282 L X+167.419 Y+122.233  
1283 L X+166.526 Y+123.398  
1284 L X+165.387 Y+124.695  
1285 L X+163.962 Y+126.129  
1286 L X+162.213 Y+127.707  
1287 L X+160.089 Y+129.44  
1288 L X+157.534 Y+131.345  
1289 L X+154.465 Y+133.454  
1290 L X+150.765 Y+135.818  
1291 L X+146.227 Y+138.541  
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1293 L X+124.667 Y+150.608  
1294 L X+117.238 Y+154.918  
1295 L X+108.826 Y+159.983  
1296 L X+91.174 Y+170.852  
1297 L X+83.975 Y+175.191  
1298 L X+77.461 Y+178.979  
1299 L X+71.504 Y+182.283  
1300 L X+65.92 Y+185.213  
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1302 L X+55.62 Y+190.127  
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1304 L X+44.801 Y+194.572  
1305 L X+39.02 Y+196.68  
1306 L X+33.034 Y+198.686  
1307 L X+26.891 Y+200.567  
1308 L X+20.664 Y+202.299  
1309 L X+14.408 Y+203.865  
1310 L X+8.211 Y+205.244  
1311 L X+2.133 Y+206.428  
1312 L X-3.77 Y+207.412  
1313 L X-9.448 Y+208.196  
1314 L X-14.847 Y+208.781  
1315 L X-20.626 Y+209.217  
1316 L X-25.257 Y+209.405  
1317 L X-29.544 Y+209.431  
1318 L X-33.528 Y+209.305  
1319 L X-37.252 Y+209.039  
1320 L X-40.756 Y+208.641  
1321 L X-44.073 Y+208.115

1322 L X-47.233 Y+207.465  
1323 L X-50.264 Y+206.691  
1324 L X-53.192 Y+205.792  
1325 L X-56.039 Y+204.763  
1326 L X-58.823 Y+203.598  
1327 L X-61.534 Y+202.304  
1328 L X-64.615 Y+200.634  
1329 L X-67.283 Y+199.011  
1330 L X-70.057 Y+197.148  
1331 L X-72.915 Y+195.048  
1332 L X-75.847 Y+192.705  
1333 L X-78.844 Y+190.113  
1334 L X-81.888 Y+187.272  
1335 L X-84.964 Y+184.186  
1336 L X-88.05 Y+180.864  
1337 L X-91.109 Y+177.333  
1338 L X-94.11 Y+173.625  
1339 L X-97.017 Y+169.776  
1340 L X-99.824 Y+165.79  
1341 L X-100.95 Y+164.106  
1342 L X-103.162 Y+160.619  
1343 L X-104.961 Y+157.538  
1344 L X-106.432 Y+154.755  
1345 L X-107.624 Y+152.218  
1346 L X-108.576 Y+149.892  
1347 L X-109.317 Y+147.745  
1348 L X-109.874 Y+145.753  
1349 L X-110.269 Y+143.893  
1350 L X-110.521 Y+142.141  
1351 L X-110.643 Y+140.476  
1352 L X-110.646 Y+138.873  
1353 L X-110.535 Y+137.309  
1354 L X-110.31 Y+135.765  
1355 L X-109.958 Y+134.169  
1356 L X-109.698 Y+133.256  
1357 L X-109.124 Y+131.608  
1358 L X-108.392 Y+129.875  
1359 L X-107.462 Y+127.996  
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1361 L X-104.926 Y+123.804  
1362 L X-103.284 Y+121.496  
1363 L X-101.371 Y+119.053  
1364 L X-99.172 Y+116.482  
1365 L X-96.676 Y+113.794  
1366 L X-93.877 Y+111.001  
1367 L X-90.771 Y+108.119  
1368 L X-87.362 Y+105.171  
1369 L X-83.662 Y+102.18  
1370 L X-79.693 Y+99.179  
1371 L X-75.498 Y+96.211  
1372 L X-71.143 Y+93.33  
1373 L X-66.655 Y+90.558  
1374 L X-64.647 Y+89.381  
1375 L X-60.214 Y+86.92  
1376 L X-55.899 Y+84.706  
1377 L X-51.633 Y+82.698  
1378 L X-47.386 Y+80.875  
1379 L X-43.129 Y+79.225  
1380 L X-38.84 Y+77.735  
1381 L X-34.499 Y+76.398  
1382 L X-30.088 Y+75.209  
1383 L X-25.573 Y+74.157  
1384 L X-20.92 Y+73.238  
1385 L X-16.094 Y+72.446  
1386 L X-11.052 Y+71.78

1387 L X-5.759 Y+71.241  
1388 L X+1.23 Y+70.729  
1389 L X+1.167 Y+69.932  
1390 L X+4.067 Y+69.591  
1391 L X+6.777 Y+69.404  
1392 L X+9.601 Y+69.342  
1393 L X+12.595 Y+69.41  
1394 L X+15.809 Y+69.62  
1395 L X+18.803 Y+69.93  
1396 L X+22.546 Y+70.445  
1397 L X+27.358 Y+71.246  
1398 L X+33.897 Y+72.469  
1399 L X+44.673 Y+74.593  
1400 L X+52.197 Y+76.034  
1401 L X+59.69 Y+77.364  
1402 L X+66.611 Y+78.454  
1403 L X+73.034 Y+79.312  
1404 L X+79.076 Y+79.958  
1405 L X+85.126 Y+80.434  
1406 L X+92.212 Y+80.831  
1407 L X+107.864 Y+81.518  
1408 L X+113.648 Y+81.869  
1409 L X+118.7 Y+82.296  
1410 L X+123.15 Y+82.804  
1411 L X+127.138 Y+83.4  
1412 L X+130.763 Y+84.083  
1413 L X+134.093 Y+84.856  
1414 L X+137.179 Y+85.717  
1415 L X+140.06 Y+86.669  
1416 L X+142.752 Y+87.707  
1417 L X+145.652 Y+89.01  
1418 L X+148.122 Y+90.287  
1419 L X+150.615 Y+91.742  
1420 L X+153.079 Y+93.353  
1421 L X+155.47 Y+95.095  
1422 L X+157.743 Y+96.934  
1423 L X+159.862 Y+98.837  
1424 L X+161.801 Y+100.77  
1425 L X+163.541 Y+102.703  
1426 L X+165.07 Y+104.604  
1427 L X+166.382 Y+106.446  
1428 L X+167.479 Y+108.205  
1429 L X+168.367 Y+109.861  
1430 L X+169.061 Y+111.398  
1431 L X+169.576 Y+112.806  
1432 L X+169.932 Y+114.078  
1433 L X+170.151 Y+115.215  
1434 L X+170.255 Y+116.221  
1435 L X+170.265 Y+117.109  
1436 L X+170.177 Y+118.092  
1437 L X+169.975 Y+118.963  
1438 L X+169.709 Y+119.756  
1439 L X+169.322 Y+120.631  
1440 L X+168.787 Y+121.608  
1441 L X+168.072 Y+122.697  
1442 L X+167.145 Y+123.906  
1443 L X+165.971 Y+125.241  
1444 L X+164.514 Y+126.708  
1445 L X+162.734 Y+128.314  
1446 L X+160.582 Y+130.07  
1447 L X+157.999 Y+131.996  
1448 L X+154.907 Y+134.121  
1449 L X+151.186 Y+136.498  
1450 L X+146.631 Y+139.232  
1451 L X+140.788 Y+142.566



1452 L X+125.062 Y+151.304  
1453 L X+117.646 Y+155.607  
1454 L X+109.242 Y+160.666  
1455 L X+91.59 Y+171.535  
1456 L X+84.383 Y+175.88  
1457 L X+77.856 Y+179.675  
1458 L X+71.884 Y+182.987  
1459 L X+66.283 Y+185.927  
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1461 L X+55.944 Y+190.858  
1462 L X+50.647 Y+193.122  
1463 L X+45.086 Y+195.32  
1464 L X+39.284 Y+197.435  
1465 L X+33.278 Y+199.447  
1466 L X+27.116 Y+201.335  
1467 L X+20.868 Y+203.072  
1468 L X+14.592 Y+204.643  
1469 L X+8.375 Y+206.027  
1470 L X+2.276 Y+207.215  
1471 L X-3.649 Y+208.203  
1472 L X-9.35 Y+208.99  
1473 L X-14.774 Y+209.577  
1474 L X-20.58 Y+210.015  
1475 L X-25.239 Y+210.205  
1476 L X-29.555 Y+210.231  
1477 L X-33.569 Y+210.104  
1478 L X-37.326 Y+209.836  
1479 L X-40.864 Y+209.434  
1480 L X-44.216 Y+208.902  
1481 L X-47.413 Y+208.245  
1482 L X-50.481 Y+207.462  
1483 L X-53.445 Y+206.551  
1484 L X-56.329 Y+205.508  
1485 L X-59.15 Y+204.328  
1486 L X-61.897 Y+203.018  
1487 L X-65.014 Y+201.328  
1488 L X-67.714 Y+199.685  
1489 L X-70.517 Y+197.803  
1490 L X-73.402 Y+195.684  
1491 L X-76.359 Y+193.32  
1492 L X-79.378 Y+190.708  
1493 L X-82.445 Y+187.847  
1494 L X-85.541 Y+184.74  
1495 L X-88.645 Y+181.398  
1496 L X-91.723 Y+177.847  
1497 L X-94.74 Y+174.118  
1498 L X-97.663 Y+170.247  
1499 L X-100.484 Y+166.242  
1500 L X-101.62 Y+164.542  
1501 L X-103.845 Y+161.035  
1502 L X-105.66 Y+157.927  
1503 L X-107.148 Y+155.112  
1504 L X-108.357 Y+152.54  
1505 L X-109.325 Y+150.174  
1506 L X-110.081 Y+147.984  
1507 L X-110.651 Y+145.944  
1508 L X-111.057 Y+144.033  
1509 L X-111.316 Y+142.228  
1510 L X-111.443 Y+140.506  
1511 L X-111.446 Y+138.846  
1512 L X-111.331 Y+137.223  
1513 L X-111.098 Y+135.621  
1514 L X-110.734 Y+133.973  
1515 L X-110.461 Y+133.014  
1516 L X-109.871 Y+131.321

1517 L X-109.12 Y+129.541  
1518 L X-108.169 Y+127.621  
1519 L X-106.998 Y+125.559  
1520 L X-105.589 Y+123.357  
1521 L X-103.925 Y+121.017  
1522 L X-101.99 Y+118.546  
1523 L X-99.769 Y+115.95  
1524 L X-97.252 Y+113.238  
1525 L X-94.432 Y+110.424  
1526 L X-91.305 Y+107.523  
1527 L X-87.875 Y+104.557  
1528 L X-84.155 Y+101.55  
1529 L X-80.165 Y+98.533  
1530 L X-75.95 Y+95.551  
1531 L X-71.574 Y+92.656  
1532 L X-67.068 Y+89.873  
1533 L X-65.044 Y+88.686  
1534 L X-60.591 Y+86.214  
1535 L X-56.252 Y+83.988  
1536 L X-51.961 Y+81.968  
1537 L X-47.688 Y+80.135  
1538 L X-43.404 Y+78.473  
1539 L X-39.089 Y+76.975  
1540 L X-34.721 Y+75.63  
1541 L X-30.282 Y+74.433  
1542 L X-25.741 Y+73.375  
1543 L X-21.063 Y+72.451  
1544 L X-16.211 Y+71.655  
1545 L X-11.145 Y+70.986  
1546 L X-5.828 Y+70.444  
1547 L X+1.167 Y+69.932  
1548 L Z+60. FMAX  
1549 L X+6.336 Y+134.539 FMAX  
1550 L Z+39. FMAX  
1551 FQ1  
1552 L Z+30.  
1553 Q22 = Q2\*1.  
1554 FQ22  
1555 L X+10.014 Y+134.367  
1556 L X+19.251 Y+135.64  
1557 L X+8.936 Y+139.092  
1558 L X-4.86 Y+142.547  
1559 L X-17.198 Y+144.61  
1560 L X-26.742 Y+145.341  
1561 L X-32.314 Y+144.911  
1562 L X-29.828 Y+143.341  
1563 L X-23.177 Y+140.207  
1564 L X-16.702 Y+137.957  
1565 L X-9.84 Y+136.36  
1566 L X+6.336 Y+134.539  
1567 L X+5.697 Y+126.561  
1568 L X+5.7 Y+126.56  
1569 L X+10.328 Y+126.344  
1570 L X+18.502 Y+127.369  
1571 L X+45.773 Y+132.373  
1572 L X+36.529 Y+137.228  
1573 L X+24.904 Y+142.184  
1574 L X+11.181 Y+146.777  
1575 L X-3.226 Y+150.385  
1576 L X-16.23 Y+152.559  
1577 L X-26.556 Y+153.351  
1578 L X-31.828 Y+153.191  
1579 L X-35.556 Y+152.401  
1580 L X-38.983 Y+150.368  
1581 L X-42.909 Y+146.964

1582 L X-45.732 Y+143.921  
1583 L X-33.683 Y+136.314  
1584 L X-26.203 Y+132.789  
1585 L X-18.927 Y+130.261  
1586 L X-11.199 Y+128.463  
1587 L X+5.697 Y+126.561  
1588 L X+5.059 Y+118.582  
1589 L X+5.066 Y+118.581  
1590 L X+10.641 Y+118.32  
1591 L X+19.723 Y+119.46  
1592 L X+59.6 Y+126.777  
1593 L X+69.386 Y+127.823  
1594 L X+53.84 Y+137.172  
1595 L X+39.964 Y+144.46  
1596 L X+27.746 Y+149.669  
1597 L X+13.425 Y+154.462  
1598 L X-1.592 Y+158.222  
1599 L X-15.263 Y+160.508  
1600 L X-26.371 Y+161.36  
1601 L X-32.786 Y+161.166  
1602 L X-38.505 Y+159.954  
1603 L X-43.682 Y+156.882  
1604 L X-48.479 Y+152.723  
1605 L X-54.165 Y+146.594  
1606 L X-57.124 Y+142.575  
1607 L X-48.481 Y+135.948  
1608 L X-37.477 Y+129.258  
1609 L X-29.23 Y+125.371  
1610 L X-21.152 Y+122.565  
1611 L X-12.557 Y+120.565  
1612 L X+5.059 Y+118.582  
1613 L X+4.421 Y+110.603  
1614 L X+4.431 Y+110.602  
1615 L X+10.954 Y+110.297  
1616 L X+20.944 Y+111.55  
1617 L X+60.748 Y+118.854  
1618 L X+81.949 Y+121.121  
1619 L X+94.867 Y+121.834  
1620 L X+57.765 Y+144.147  
1621 L X+43.398 Y+151.693  
1622 L X+30.589 Y+157.154  
1623 L X+15.67 Y+162.147  
1624 L X+0.042 Y+166.06  
1625 L X-14.295 Y+168.458  
1626 L X-26.185 Y+169.369  
1627 L X-33.532 Y+169.147  
1628 L X-38.221 Y+168.409  
1629 L X-41.431 Y+167.424  
1630 L X-44.661 Y+165.868  
1631 L X-48.555 Y+163.245  
1632 L X-54.048 Y+158.483  
1633 L X-60.338 Y+151.703  
1634 L X-67.806 Y+141.561  
1635 L X-61.669 Y+135.882  
1636 L X-52.981 Y+129.321  
1637 L X-41.271 Y+122.202  
1638 L X-32.256 Y+117.954  
1639 L X-23.378 Y+114.869  
1640 L X-13.916 Y+112.668  
1641 L X+4.421 Y+110.603  
1642 L X+3.782 Y+102.624  
1643 L X+3.796 Y+102.623  
1644 L X+11.268 Y+102.274  
1645 L X+22.164 Y+103.641  
1646 L X+61.897 Y+110.931

1647 L X+82.596 Y+113.145  
1648 L X+115.409 Y+114.956  
1649 L X+121.171 Y+115.808  
1650 L X+92.438 Y+132.496  
1651 L X+61.701 Y+151.116  
1652 L X+46.833 Y+158.926  
1653 L X+33.432 Y+164.639  
1654 L X+17.914 Y+169.832  
1655 L X+1.675 Y+173.898  
1656 L X-13.328 Y+176.407  
1657 L X-26. Y+177.378  
1658 L X-34.277 Y+177.128  
1659 L X-40.025 Y+176.223  
1660 L X-44.356 Y+174.895  
1661 L X-48.653 Y+172.825  
1662 L X-53.428 Y+169.608  
1663 L X-59.617 Y+164.243  
1664 L X-66.497 Y+156.826  
1665 L X-74.212 Y+146.458  
1666 L X-77.562 Y+140.706  
1667 L X-73.605 Y+136.028  
1668 L X-66.809 Y+129.738  
1669 L X-57.48 Y+122.695  
1670 L X-45.065 Y+115.146  
1671 L X-35.282 Y+110.536  
1672 L X-25.604 Y+107.173  
1673 L X-15.275 Y+104.77  
1674 L X+3.782 Y+102.624  
1675 L X+3.144 Y+94.646  
1676 L X+3.161 Y+94.644  
1677 L X+11.581 Y+94.25  
1678 L X+23.385 Y+95.731  
1679 L X+63.046 Y+103.008  
1680 L X+83.242 Y+105.168  
1681 L X+116.216 Y+106.989  
1682 L X+125.631 Y+108.38  
1683 L X+131.65 Y+110.051  
1684 L X+135.993 Y+111.999  
1685 L X+139.494 Y+114.417  
1686 L X+96.52 Y+139.377  
1687 L X+65.637 Y+158.085  
1688 L X+50.267 Y+166.158  
1689 L X+36.275 Y+172.123  
1690 L X+20.159 Y+177.517  
1691 L X+3.309 Y+181.736  
1692 L X-12.361 Y+184.356  
1693 L X-25.815 Y+185.388  
1694 L X-35.023 Y+185.109  
1695 L X-41.829 Y+184.038  
1696 L X-47.282 Y+182.365  
1697 L X-52.644 Y+179.782  
1698 L X-58.301 Y+175.971  
1699 L X-65.186 Y+170.002  
1700 L X-72.656 Y+161.949  
1701 L X-80.89 Y+150.885  
1702 L X-84.813 Y+144.206  
1703 L X-86.366 Y+139.761  
1704 L X-83.899 Y+135.736  
1705 L X-79.376 Y+130.468  
1706 L X-71.949 Y+123.595  
1707 L X-61.98 Y+116.068  
1708 L X-48.858 Y+108.09  
1709 L X-38.309 Y+103.118  
1710 L X-27.829 Y+99.478  
1711 L X-16.633 Y+96.872

1712 L X+3.144 Y+94.646  
1713 L X+2.506 Y+86.671  
1714 L X+2.677 Y+86.658  
1715 L X+11.894 Y+86.227  
1716 L X+24.606 Y+87.821  
1717 L X+64.195 Y+95.086  
1718 L X+83.888 Y+97.192  
1719 L X+117.023 Y+99.021  
1720 L X+127.292 Y+100.539  
1721 L X+134.372 Y+102.504  
1722 L X+139.937 Y+104.999  
1723 L X+146.816 Y+109.753  
1724 L X+151.918 Y+115.258  
1725 L X+145.541 Y+120.157  
1726 L X+100.602 Y+146.258  
1727 L X+69.573 Y+165.054  
1728 L X+53.701 Y+173.391  
1729 L X+39.118 Y+179.608  
1730 L X+22.403 Y+185.202  
1731 L X+4.943 Y+189.574  
1732 L X-11.393 Y+192.306  
1733 L X-25.629 Y+193.397  
1734 L X-35.769 Y+193.09  
1735 L X-43.633 Y+191.852  
1736 L X-50.208 Y+189.836  
1737 L X-56.635 Y+186.739  
1738 L X-63.174 Y+182.335  
1739 L X-70.755 Y+175.762  
1740 L X-78.816 Y+167.073  
1741 L X-87.568 Y+155.312  
1742 L X-92.043 Y+147.693  
1743 L X-94.224 Y+142.034  
1744 L X-94.479 Y+138.993  
1745 L X-93.741 Y+136.485  
1746 L X-90.385 Y+131.01  
1747 L X-85.147 Y+124.908  
1748 L X-77.089 Y+117.452  
1749 L X-66.48 Y+109.441  
1750 L X-52.652 Y+101.034  
1751 L X-41.335 Y+95.701  
1752 L X-30.054 Y+91.782  
1753 L X-18.065 Y+88.992  
1754 L X-4.241 Y+87.172  
1755 L X+2.506 Y+86.671  
1756 L X+1.868 Y+78.696  
1757 L X+2.193 Y+78.672  
1758 L X+12.208 Y+78.203  
1759 L X+25.827 Y+79.912  
1760 L X+65.344 Y+87.163  
1761 L X+84.535 Y+89.215  
1762 L X+117.83 Y+91.053  
1763 L X+128.953 Y+92.697  
1764 L X+137.094 Y+94.957  
1765 L X+143.881 Y+98.  
1766 L X+152.032 Y+103.633  
1767 L X+158.051 Y+109.918  
1768 L X+160.907 Y+114.723  
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1770 L X+158.441 Y+120.335  
1771 L X+150.045 Y+126.785  
1772 L X+136.47 Y+134.898  
1773 L X+104.666 Y+153.15  
1774 L X+73.509 Y+172.023  
1775 L X+57.136 Y+180.623  
1776 L X+41.96 Y+187.093

1777 L X+24.648 Y+192.887  
1778 L X+6.577 Y+197.412  
1779 L X-10.426 Y+200.255  
1780 L X-25.444 Y+201.406  
1781 L X-36.515 Y+201.071  
1782 L X-45.437 Y+199.667  
1783 L X-53.133 Y+197.306  
1784 L X-60.627 Y+193.697  
1785 L X-68.047 Y+188.698  
1786 L X-76.325 Y+181.521  
1787 L X-84.975 Y+172.196  
1788 L X-94.246 Y+159.739  
1789 L X-99.272 Y+151.181  
1790 L X-102.101 Y+143.843  
1791 L X-102.576 Y+138.17  
1792 L X-101.117 Y+133.209  
1793 L X-96.872 Y+126.284  
1794 L X-90.917 Y+119.349  
1795 L X-82.229 Y+111.308  
1796 L X-70.98 Y+102.814  
1797 L X-56.446 Y+93.978  
1798 L X-44.361 Y+88.283  
1799 L X-32.28 Y+84.086  
1800 L X-19.497 Y+81.111  
1801 L X-5.061 Y+79.211  
1802 L X+1.868 Y+78.696  
1803 L X+1.23 Y+70.729  
1804 L X+1.243 Y+70.728  
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1806 L X+6.814 Y+70.203  
1807 L X+9.6 Y+70.142  
1808 L X+12.56 Y+70.209  
1809 L X+15.742 Y+70.417  
1810 L X+18.707 Y+70.724  
1811 L X+22.426 Y+71.236  
1812 L X+27.219 Y+72.034  
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1814 L X+44.52 Y+75.378  
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1830 L X+139.79 Y+87.422  
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1836 L X+154.983 Y+95.73  
1837 L X+157.224 Y+97.543  
1838 L X+159.312 Y+99.418  
1839 L X+161.221 Y+101.322  
1840 L X+162.932 Y+103.221  
1841 L X+164.432 Y+105.087

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1843 L X+166.786 Y+108.606  
1844 L X+167.65 Y+110.215  
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1847 L X+169.152 Y+114.262  
1848 L X+169.358 Y+115.332  
1849 L X+169.455 Y+116.267  
1850 L X+169.464 Y+117.078  
1851 L X+169.385 Y+117.965  
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1854 L X+168.604 Y+120.277  
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1858 L X+165.387 Y+124.695  
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1864 L X+150.765 Y+135.818  
1865 L X+146.227 Y+138.541  
1866 L X+140.395 Y+141.869  
1867 L X+124.667 Y+150.608  
1868 L X+117.238 Y+154.918  
1869 L X+108.826 Y+159.983  
1870 L X+91.174 Y+170.852  
1871 L X+83.975 Y+175.191  
1872 L X+77.461 Y+178.979  
1873 L X+71.504 Y+182.283  
1874 L X+65.92 Y+185.213  
1875 L X+60.576 Y+187.846  
1876 L X+55.62 Y+190.127  
1877 L X+50.343 Y+192.382  
1878 L X+44.801 Y+194.572  
1879 L X+39.02 Y+196.68  
1880 L X+33.034 Y+198.686  
1881 L X+26.891 Y+200.567  
1882 L X+20.664 Y+202.299  
1883 L X+14.408 Y+203.865  
1884 L X+8.211 Y+205.244  
1885 L X+2.133 Y+206.428  
1886 L X-3.77 Y+207.412  
1887 L X-9.448 Y+208.196  
1888 L X-14.847 Y+208.781  
1889 L X-20.626 Y+209.217  
1890 L X-25.257 Y+209.405  
1891 L X-29.544 Y+209.431  
1892 L X-33.528 Y+209.305  
1893 L X-37.252 Y+209.039  
1894 L X-40.756 Y+208.641  
1895 L X-44.073 Y+208.115  
1896 L X-47.233 Y+207.465  
1897 L X-50.264 Y+206.691  
1898 L X-53.192 Y+205.792  
1899 L X-56.039 Y+204.763  
1900 L X-58.823 Y+203.598  
1901 L X-61.534 Y+202.304  
1902 L X-64.615 Y+200.634  
1903 L X-67.283 Y+199.011  
1904 L X-70.057 Y+197.148  
1905 L X-72.915 Y+195.048  
1906 L X-75.847 Y+192.705

1907 L X-78.844 Y+190.113  
1908 L X-81.888 Y+187.272  
1909 L X-84.964 Y+184.186  
1910 L X-88.05 Y+180.864  
1911 L X-91.109 Y+177.333  
1912 L X-94.11 Y+173.625  
1913 L X-97.017 Y+169.776  
1914 L X-99.824 Y+165.79  
1915 L X-100.95 Y+164.106  
1916 L X-103.162 Y+160.619  
1917 L X-104.961 Y+157.538  
1918 L X-106.432 Y+154.755  
1919 L X-107.624 Y+152.218  
1920 L X-108.576 Y+149.892  
1921 L X-109.317 Y+147.745  
1922 L X-109.874 Y+145.753  
1923 L X-110.269 Y+143.893  
1924 L X-110.521 Y+142.141  
1925 L X-110.643 Y+140.476  
1926 L X-110.646 Y+138.873  
1927 L X-110.535 Y+137.309  
1928 L X-110.31 Y+135.765  
1929 L X-109.958 Y+134.169  
1930 L X-109.698 Y+133.256  
1931 L X-109.124 Y+131.608  
1932 L X-108.392 Y+129.875  
1933 L X-107.462 Y+127.996  
1934 L X-106.313 Y+125.972  
1935 L X-104.926 Y+123.804  
1936 L X-103.284 Y+121.496  
1937 L X-101.371 Y+119.053  
1938 L X-99.172 Y+116.482  
1939 L X-96.676 Y+113.794  
1940 L X-93.877 Y+111.001  
1941 L X-90.771 Y+108.119  
1942 L X-87.362 Y+105.171  
1943 L X-83.662 Y+102.18  
1944 L X-79.693 Y+99.179  
1945 L X-75.498 Y+96.211  
1946 L X-71.143 Y+93.33  
1947 L X-66.655 Y+90.558  
1948 L X-64.647 Y+89.381  
1949 L X-60.214 Y+86.92  
1950 L X-55.899 Y+84.706  
1951 L X-51.633 Y+82.698  
1952 L X-47.386 Y+80.875  
1953 L X-43.129 Y+79.225  
1954 L X-38.84 Y+77.735  
1955 L X-34.499 Y+76.398  
1956 L X-30.088 Y+75.209  
1957 L X-25.573 Y+74.157  
1958 L X-20.92 Y+73.238  
1959 L X-16.094 Y+72.446  
1960 L X-11.052 Y+71.78  
1961 L X-5.759 Y+71.241  
1962 L X+1.23 Y+70.729  
1963 L X+1.167 Y+69.932  
1964 L X+4.067 Y+69.591  
1965 L X+6.777 Y+69.404  
1966 L X+9.601 Y+69.342  
1967 L X+12.595 Y+69.41  
1968 L X+15.809 Y+69.62  
1969 L X+18.803 Y+69.93  
1970 L X+22.546 Y+70.445  
1971 L X+27.358 Y+71.246



1972 L X+33.897 Y+72.469  
1973 L X+44.673 Y+74.593  
1974 L X+52.197 Y+76.034  
1975 L X+59.69 Y+77.364  
1976 L X+66.611 Y+78.454  
1977 L X+73.034 Y+79.312  
1978 L X+79.076 Y+79.958  
1979 L X+85.126 Y+80.434  
1980 L X+92.212 Y+80.831  
1981 L X+107.864 Y+81.518  
1982 L X+113.648 Y+81.869  
1983 L X+118.7 Y+82.296  
1984 L X+123.15 Y+82.804  
1985 L X+127.138 Y+83.4  
1986 L X+130.763 Y+84.083  
1987 L X+134.093 Y+84.856  
1988 L X+137.179 Y+85.717  
1989 L X+140.06 Y+86.669  
1990 L X+142.752 Y+87.707  
1991 L X+145.652 Y+89.01  
1992 L X+148.122 Y+90.287  
1993 L X+150.615 Y+91.742  
1994 L X+153.079 Y+93.353  
1995 L X+155.47 Y+95.095  
1996 L X+157.743 Y+96.934  
1997 L X+159.862 Y+98.837  
1998 L X+161.801 Y+100.77  
1999 L X+163.541 Y+102.703  
2000 L X+165.07 Y+104.604  
2001 L X+166.382 Y+106.446  
2002 L X+167.479 Y+108.205  
2003 L X+168.367 Y+109.861  
2004 L X+169.061 Y+111.398  
2005 L X+169.576 Y+112.806  
2006 L X+169.932 Y+114.078  
2007 L X+170.151 Y+115.215  
2008 L X+170.255 Y+116.221  
2009 L X+170.265 Y+117.109  
2010 L X+170.177 Y+118.092  
2011 L X+169.975 Y+118.963  
2012 L X+169.709 Y+119.756  
2013 L X+169.322 Y+120.631  
2014 L X+168.787 Y+121.608  
2015 L X+168.072 Y+122.697  
2016 L X+167.145 Y+123.906  
2017 L X+165.971 Y+125.241  
2018 L X+164.514 Y+126.708  
2019 L X+162.734 Y+128.314  
2020 L X+160.582 Y+130.07  
2021 L X+157.999 Y+131.996  
2022 L X+154.907 Y+134.121  
2023 L X+151.186 Y+136.498  
2024 L X+146.631 Y+139.232  
2025 L X+140.788 Y+142.566  
2026 L X+125.062 Y+151.304  
2027 L X+117.646 Y+155.607  
2028 L X+109.242 Y+160.666  
2029 L X+91.59 Y+171.535  
2030 L X+84.383 Y+175.88  
2031 L X+77.856 Y+179.675  
2032 L X+71.884 Y+182.987  
2033 L X+66.283 Y+185.927  
2034 L X+60.92 Y+188.569  
2035 L X+55.944 Y+190.858  
2036 L X+50.647 Y+193.122

2037 L X+45.086 Y+195.32  
2038 L X+39.284 Y+197.435  
2039 L X+33.278 Y+199.447  
2040 L X+27.116 Y+201.335  
2041 L X+20.868 Y+203.072  
2042 L X+14.592 Y+204.643  
2043 L X+8.375 Y+206.027  
2044 L X+2.276 Y+207.215  
2045 L X-3.649 Y+208.203  
2046 L X-9.35 Y+208.99  
2047 L X-14.774 Y+209.577  
2048 L X-20.58 Y+210.015  
2049 L X-25.239 Y+210.205  
2050 L X-29.555 Y+210.231  
2051 L X-33.569 Y+210.104  
2052 L X-37.326 Y+209.836  
2053 L X-40.864 Y+209.434  
2054 L X-44.216 Y+208.902  
2055 L X-47.413 Y+208.245  
2056 L X-50.481 Y+207.462  
2057 L X-53.445 Y+206.551  
2058 L X-56.329 Y+205.508  
2059 L X-59.15 Y+204.328  
2060 L X-61.897 Y+203.018  
2061 L X-65.014 Y+201.328  
2062 L X-67.714 Y+199.685  
2063 L X-70.517 Y+197.803  
2064 L X-73.402 Y+195.684  
2065 L X-76.359 Y+193.32  
2066 L X-79.378 Y+190.708  
2067 L X-82.445 Y+187.847  
2068 L X-85.541 Y+184.74  
2069 L X-88.645 Y+181.398  
2070 L X-91.723 Y+177.847  
2071 L X-94.74 Y+174.118  
2072 L X-97.663 Y+170.247  
2073 L X-100.484 Y+166.242  
2074 L X-101.62 Y+164.542  
2075 L X-103.845 Y+161.035  
2076 L X-105.66 Y+157.927  
2077 L X-107.148 Y+155.112  
2078 L X-108.357 Y+152.54  
2079 L X-109.325 Y+150.174  
2080 L X-110.081 Y+147.984  
2081 L X-110.651 Y+145.944  
2082 L X-111.057 Y+144.033  
2083 L X-111.316 Y+142.228  
2084 L X-111.443 Y+140.506  
2085 L X-111.446 Y+138.846  
2086 L X-111.331 Y+137.223  
2087 L X-111.098 Y+135.621  
2088 L X-110.734 Y+133.973  
2089 L X-110.461 Y+133.014  
2090 L X-109.871 Y+131.321  
2091 L X-109.12 Y+129.541  
2092 L X-108.169 Y+127.621  
2093 L X-106.998 Y+125.559  
2094 L X-105.589 Y+123.357  
2095 L X-103.925 Y+121.017  
2096 L X-101.99 Y+118.546  
2097 L X-99.769 Y+115.95  
2098 L X-97.252 Y+113.238  
2099 L X-94.432 Y+110.424  
2100 L X-91.305 Y+107.523  
2101 L X-87.875 Y+104.557

2102 L X-84.155 Y+101.55  
2103 L X-80.165 Y+98.533  
2104 L X-75.95 Y+95.551  
2105 L X-71.574 Y+92.656  
2106 L X-67.068 Y+89.873  
2107 L X-65.044 Y+88.686  
2108 L X-60.591 Y+86.214  
2109 L X-56.252 Y+83.988  
2110 L X-51.961 Y+81.968  
2111 L X-47.688 Y+80.135  
2112 L X-43.404 Y+78.473  
2113 L X-39.089 Y+76.975  
2114 L X-34.721 Y+75.63  
2115 L X-30.282 Y+74.433  
2116 L X-25.741 Y+73.375  
2117 L X-21.063 Y+72.451  
2118 L X-16.211 Y+71.655  
2119 L X-11.145 Y+70.986  
2120 L X-5.828 Y+70.444  
2121 L X+1.167 Y+69.932  
2122 L Z+60. FMAX  
2123 L Z+60. R0 FMAX  
2124 M9  
2125 ; T66 NAVRTAVACEK - PRUM 2.5  
2126 ; -- DEFINICE POSUVU PRO NASTROJ  
2127 FN 0: Q3 = 20000 ; (PLYNULY RYCHLOPOSUV)  
2128 TOOL CALL 66 Z S3820  
2129 L M6  
2130 L Z+60. R0 FMAX M8  
2131 L X-200. Y+200. FMAX M3  
2132 CYCL DEF 200 VRTANI ~  
Q200=+5. ;BEZPEC.VZDAL. ~  
Q201=-5.178 ;HLOUBKA ~  
Q206=+412.53 ;POSUV PRISUVU DO HL. ~  
Q202=+5.178 ;PRISUV ~  
Q210=0 ;CAS.PRODLEVA NAHORE ~  
Q203=+50. ;SOURADNICE POVRCHU ~  
Q204=+10. ;2.BEZP.VZDAL. ~  
Q211=0 ;CAS.PRODLEVA DOLE  
2133 L X-200. Y+200. FMAX M99  
2134 L Y+50. FMAX M99  
2135 L X+200. FMAX M99  
2136 L Y+200. FMAX M99  
2137 L Z+60. R0 FMAX  
2138 L Z+60. R0 FMAX  
2139 M9  
2140 ; T38 VRTAK - PRUM 20.  
2141 ; -- DEFINICE POSUVU PRO NASTROJ  
2142 FN 0: Q3 = 20000 ; (PLYNULY RYCHLOPOSUV)  
2143 TOOL CALL 38 Z S477  
2144 L M6  
2145 L Z+60. R0 FMAX M8  
2146 L X-200. Y+200. FMAX M3  
2147 CYCL DEF 200 VRTANI ~  
Q200=+5. ;BEZPEC.VZDAL. ~  
Q201=-58.61 ;HLOUBKA ~  
Q206=+183.347 ;POSUV PRISUVU DO HL. ~  
Q202=+58.61 ;PRISUV ~  
Q210=0 ;CAS.PRODLEVA NAHORE ~  
Q203=+50. ;SOURADNICE POVRCHU ~  
Q204=+10. ;2.BEZP.VZDAL. ~  
Q211=0 ;CAS.PRODLEVA DOLE  
2148 L X-200. Y+200. FMAX M99  
2149 L Y+50. FMAX M99  
2150 L X+200. FMAX M99

2151 L Y+200. FMAX M99  
2152 L Z+60. R0 FMAX  
2153 L Z+60. R0 FMAX  
2154 M9  
2155 ; T273 VALCOVY ZAHLUBNIK - PRUM 26.  
2156 ; -- DEFINICE POSUVU PRO NASTROJ  
2157 FN 0: Q3 = 20000 ; (PLYNULY RYCHLOPOSUV)  
2158 TOOL CALL 273 Z S367  
2159 L M6  
2160 L Z+60. R0 FMAX M8  
2161 L X-200. Y+200. FMAX M3  
2162 CYCL DEF 200 VRTANI ~  
Q200=+5. ;BEZPEC.VZDAL. ~  
Q201=-32. ;HLOUBKA ~  
Q206=+881.474 ;POSUV PRISUVU DO HL. ~  
Q202=+32. ;PRISUV ~  
Q210=0 ;CAS.PRODLEVA NAHORE ~  
Q203=+50. ;SOURADNICE POVRCHU ~  
Q204=+10. ;2.BEZP.VZDAL. ~  
Q211=0 ;CAS.PRODLEVA DOLE  
2163 L X-200. Y+200. FMAX M99  
2164 L Y+50. FMAX M99  
2165 L X+200. FMAX M99  
2166 L Y+200. FMAX M99  
2167 L Z+60. R0 FMAX  
2168 L R0 FMAX  
2169 M9  
2170 M2  
2171 END PGM cviceni3Nastavení\_Jedna MM