

AZIMUTH PATTERN Horizontal Polarization

Proposal No. **C-70003**
 Date **14-Feb-17**
 Call Letters **WZTV 20**
 Frequency **509 MHz**
 Antenna Type **TFU-18DSC/VP-R P230**

 Gain **2.29 (3.6dB)**
Calculated

 Directional
 Drawing # **TFU-P230-20**

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.524	36	0.523	72	0.468	108	0.654	144	0.993	180	0.524	216	0.523	252	0.468	288	0.654	324	0.993
1	0.510	37	0.529	73	0.461	109	0.671	145	0.989	181	0.510	217	0.529	253	0.461	289	0.671	325	0.989
2	0.496	38	0.535	74	0.453	110	0.688	146	0.985	182	0.496	218	0.535	254	0.453	290	0.688	326	0.985
3	0.483	39	0.540	75	0.447	111	0.705	147	0.980	183	0.483	219	0.540	255	0.447	291	0.705	327	0.980
4	0.471	40	0.545	76	0.440	112	0.722	148	0.974	184	0.471	220	0.545	256	0.440	292	0.722	328	0.974
5	0.460	41	0.549	77	0.434	113	0.738	149	0.967	185	0.460	221	0.549	257	0.434	293	0.738	329	0.967
6	0.449	42	0.554	78	0.428	114	0.755	150	0.960	186	0.449	222	0.554	258	0.428	294	0.755	330	0.960
7	0.440	43	0.557	79	0.422	115	0.771	151	0.951	187	0.440	223	0.557	259	0.422	295	0.771	331	0.951
8	0.431	44	0.560	80	0.417	116	0.787	152	0.942	188	0.431	224	0.560	260	0.417	296	0.787	332	0.942
9	0.425	45	0.563	81	0.413	117	0.802	153	0.932	189	0.425	225	0.563	261	0.413	297	0.802	333	0.932
10	0.418	46	0.565	82	0.410	118	0.818	154	0.922	190	0.418	226	0.565	262	0.410	298	0.818	334	0.922
11	0.414	47	0.567	83	0.408	119	0.833	155	0.911	191	0.414	227	0.567	263	0.408	299	0.833	335	0.911
12	0.409	48	0.568	84	0.405	120	0.847	156	0.900	192	0.409	228	0.568	264	0.405	300	0.847	336	0.900
13	0.407	49	0.569	85	0.405	121	0.861	157	0.887	193	0.407	229	0.569	265	0.405	301	0.861	337	0.887
14	0.405	50	0.569	86	0.405	122	0.874	158	0.874	194	0.405	230	0.569	266	0.405	302	0.874	338	0.874
15	0.405	51	0.569	87	0.407	123	0.887	159	0.861	195	0.405	231	0.569	267	0.407	303	0.887	339	0.861
16	0.405	52	0.568	88	0.409	124	0.900	160	0.847	196	0.405	232	0.568	268	0.409	304	0.900	340	0.847
17	0.408	53	0.567	89	0.414	125	0.911	161	0.833	197	0.408	233	0.567	269	0.414	305	0.911	341	0.833
18	0.410	54	0.565	90	0.418	126	0.922	162	0.818	198	0.410	234	0.565	270	0.418	306	0.922	342	0.818
19	0.413	55	0.563	91	0.425	127	0.932	163	0.802	199	0.413	235	0.563	271	0.425	307	0.932	343	0.802
20	0.417	56	0.560	92	0.431	128	0.942	164	0.787	200	0.417	236	0.560	272	0.431	308	0.942	344	0.787
21	0.422	57	0.557	93	0.440	129	0.951	165	0.771	201	0.422	237	0.557	273	0.440	309	0.951	345	0.771
22	0.428	58	0.554	94	0.449	130	0.960	166	0.755	202	0.428	238	0.554	274	0.449	310	0.960	346	0.755
23	0.434	59	0.549	95	0.460	131	0.967	167	0.738	203	0.434	239	0.549	275	0.460	311	0.967	347	0.738
24	0.440	60	0.545	96	0.471	132	0.974	168	0.722	204	0.440	240	0.545	276	0.471	312	0.974	348	0.722
25	0.447	61	0.540	97	0.483	133	0.980	169	0.705	205	0.447	241	0.540	277	0.483	313	0.980	349	0.705
26	0.453	62	0.535	98	0.496	134	0.985	170	0.688	206	0.453	242	0.535	278	0.496	314	0.985	350	0.688
27	0.461	63	0.529	99	0.510	135	0.989	171	0.671	207	0.461	243	0.529	279	0.510	315	0.989	351	0.671
28	0.468	64	0.523	100	0.524	136	0.993	172	0.654	208	0.468	244	0.523	280	0.524	316	0.993	352	0.654
29	0.475	65	0.517	101	0.539	137	0.996	173	0.637	209	0.475	245	0.517	281	0.539	317	0.996	353	0.637
30	0.483	66	0.511	102	0.554	138	0.998	174	0.620	210	0.483	246	0.511	282	0.554	318	0.998	354	0.620
31	0.490	67	0.504	103	0.570	139	0.999	175	0.603	211	0.490	247	0.504	283	0.570	319	0.999	355	0.603
32	0.497	68	0.497	104	0.586	140	1.000	176	0.586	212	0.497	248	0.497	284	0.586	320	1.000	356	0.586
33	0.504	69	0.490	105	0.603	141	0.999	177	0.570	213	0.504	249	0.490	285	0.603	321	0.999	357	0.570
34	0.511	70	0.483	106	0.620	142	0.998	178	0.554	214	0.511	250	0.483	286	0.620	322	0.998	358	0.554
35	0.517	71	0.475	107	0.637	143	0.996	179	0.539	215	0.517	251	0.475	287	0.637	323	0.996	359	0.539

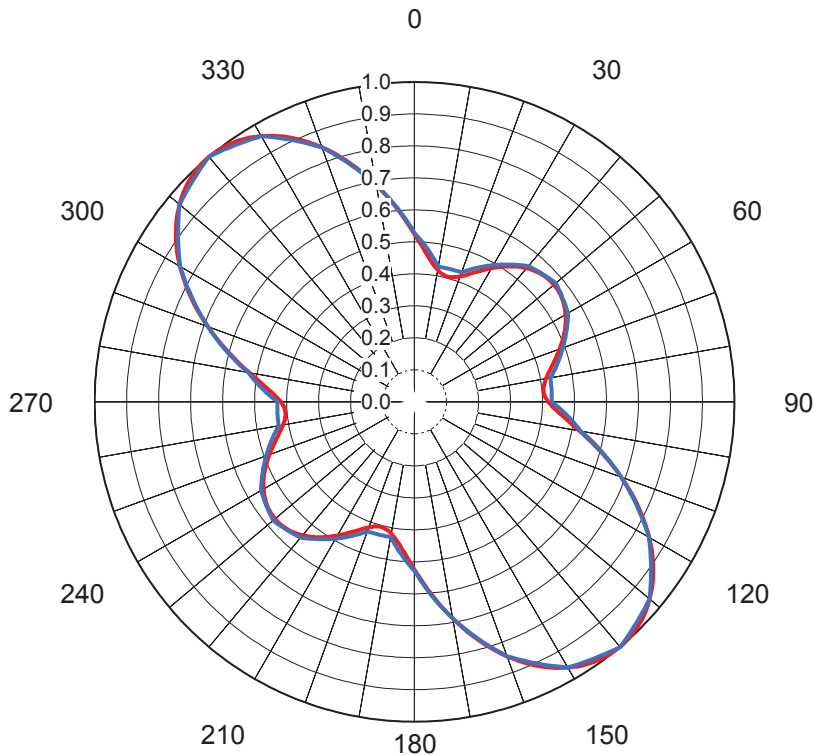
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AZIMUTH OVERLAY

Proposal No. **C-70003**
 Date **14-Feb-17**
 Call Letters **WZTV 20**
 Frequency **509 MHz**
 Antenna Type **TFU-18DSC/VP-R P230**

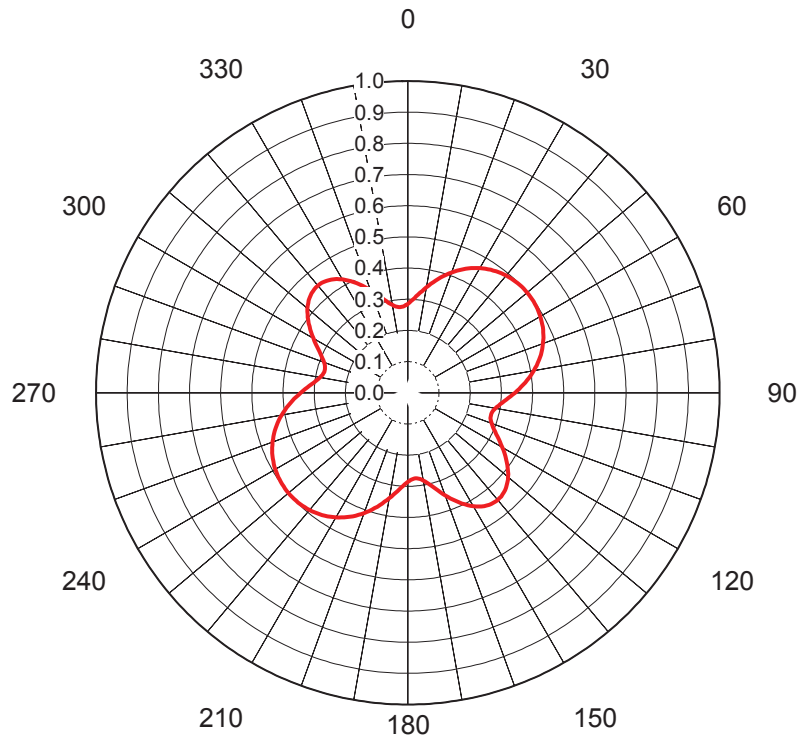
Red Drawing # **TFU-P230-20**

Blue Drawing # **FCC File**



Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.524	36	0.523	72	0.468	108	0.654	144	0.993	180	0.524	216	0.523	252	0.468	288	0.654
1	0.510	37	0.529	73	0.461	109	0.671	145	0.989	181	0.510	217	0.529	253	0.461	289	0.671
2	0.496	38	0.535	74	0.453	110	0.688	146	0.985	182	0.496	218	0.535	254	0.453	290	0.688
3	0.483	39	0.540	75	0.447	111	0.705	147	0.980	183	0.483	219	0.540	255	0.447	291	0.705
4	0.471	40	0.545	76	0.440	112	0.722	148	0.974	184	0.471	220	0.545	256	0.440	292	0.722
5	0.460	41	0.549	77	0.434	113	0.738	149	0.967	185	0.460	221	0.549	257	0.434	293	0.738
6	0.449	42	0.554	78	0.428	114	0.755	150	0.960	186	0.449	222	0.554	258	0.428	294	0.755
7	0.440	43	0.557	79	0.422	115	0.771	151	0.951	187	0.440	223	0.557	259	0.422	295	0.771
8	0.431	44	0.560	80	0.417	116	0.787	152	0.942	188	0.431	224	0.560	260	0.417	296	0.787
9	0.425	45	0.563	81	0.413	117	0.802	153	0.932	189	0.425	225	0.563	261	0.413	297	0.802
10	0.418	46	0.565	82	0.410	118	0.818	154	0.922	190	0.418	226	0.565	262	0.410	298	0.818
11	0.414	47	0.567	83	0.408	119	0.833	155	0.911	191	0.414	227	0.567	263	0.408	299	0.833
12	0.409	48	0.568	84	0.405	120	0.847	156	0.900	192	0.409	228	0.568	264	0.405	300	0.847
13	0.407	49	0.569	85	0.405	121	0.861	157	0.887	193	0.407	229	0.569	265	0.405	301	0.861
14	0.405	50	0.569	86	0.405	122	0.874	158	0.874	194	0.405	230	0.569	266	0.405	302	0.874
15	0.405	51	0.569	87	0.407	123	0.887	159	0.861	195	0.405	231	0.569	267	0.407	303	0.887
16	0.405	52	0.568	88	0.409	124	0.900	160	0.847	196	0.405	232	0.568	268	0.409	304	0.900
17	0.408	53	0.567	89	0.414	125	0.911	161	0.833	197	0.408	233	0.567	269	0.414	305	0.911
18	0.410	54	0.565	90	0.418	126	0.922	162	0.818	198	0.410	234	0.565	270	0.418	306	0.922
19	0.413	55	0.563	91	0.425	127	0.932	163	0.802	199	0.413	235	0.563	271	0.425	307	0.932
20	0.417	56	0.560	92	0.431	128	0.942	164	0.787	200	0.417	236	0.560	272	0.431	308	0.942
21	0.422	57	0.557	93	0.440	129	0.951	165	0.771	201	0.422	237	0.557	273	0.440	309	0.951
22	0.428	58	0.554	94	0.449	130	0.960	166	0.755	202	0.428	238	0.554	274	0.449	310	0.960
23	0.434	59	0.549	95	0.460	131	0.967	167	0.738	203	0.434	239	0.549	275	0.460	311	0.967
24	0.440	60	0.545	96	0.471	132	0.974	168	0.722	204	0.440	240	0.545	276	0.471	312	0.974
25	0.447	61	0.540	97	0.483	133	0.980	169	0.705	205	0.447	241	0.540	277	0.483	313	0.980
26	0.453	62	0.535	98	0.496	134	0.985	170	0.688	206	0.453	242	0.535	278	0.496	314	0.985
27	0.461	63	0.529	99	0.510	135	0.989	171	0.671	207	0.461	243	0.529	279	0.510	315	0.989
28	0.468	64	0.523	100	0.524	136	0.993	172	0.654	208	0.468	244	0.523	280	0.524	316	0.993
29	0.475	65	0.517	101	0.539	137	0.996	173	0.637	209	0.475	245	0.517	281	0.539	317	0.996
30	0.483	66	0.511	102	0.554	138	0.998	174	0.620	210	0.483	246	0.511	282	0.554	318	0.998
31	0.490	67	0.504	103	0.570	139	0.999	175	0.603	211	0.490	247	0.504	283	0.570	319	0.999
32	0.497	68	0.497	104	0.586	140	1.000	176	0.586	212	0.497	248	0.497	284	0.586	320	1.000
33	0.504	69	0.490	105	0.603	141	0.999	177	0.570	213	0.504	249	0.490	285	0.603	321	0.999
34	0.511	70	0.483	106	0.620	142	0.998	178	0.554	214	0.511	250	0.483	286	0.620	322	0.998
35	0.517	71	0.475	107	0.637	143	0.996	179	0.539	215	0.517	251	0.475	287	0.637	323	0.996

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AZIMUTH PATTERN Vertical Polarization

Proposal No. **C-70003**
 Date **14-Feb-17**
 Call Letters **WZTV 20**
 Frequency **509 MHz**
 Antenna Type **TFU-18DSC/VP-R P230**

Gain **1.58 (1.97dB)**
Calculated

Directional
 Drawing # **TFU-P230-20-V**

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.286	36	0.482	72	0.453	108	0.280	144	0.444	180	0.286	216	0.482	252	0.453	288	0.280
1	0.290	37	0.484	73	0.449	109	0.282	145	0.441	181	0.290	217	0.484	253	0.449	289	0.282
2	0.294	38	0.487	74	0.444	110	0.286	146	0.438	182	0.294	218	0.487	254	0.444	290	0.286
3	0.299	39	0.489	75	0.439	111	0.290	147	0.434	183	0.299	219	0.489	255	0.439	291	0.290
4	0.305	40	0.491	76	0.434	112	0.295	148	0.430	184	0.305	220	0.491	256	0.434	292	0.295
5	0.310	41	0.493	77	0.428	113	0.300	149	0.425	185	0.310	221	0.493	257	0.428	293	0.300
6	0.317	42	0.494	78	0.423	114	0.307	150	0.420	186	0.317	222	0.494	258	0.423	294	0.307
7	0.323	43	0.495	79	0.417	115	0.313	151	0.414	187	0.323	223	0.495	259	0.417	295	0.313
8	0.330	44	0.497	80	0.411	116	0.320	152	0.408	188	0.330	224	0.497	260	0.411	296	0.320
9	0.337	45	0.498	81	0.405	117	0.327	153	0.402	189	0.337	225	0.498	261	0.405	297	0.327
10	0.343	46	0.499	82	0.398	118	0.335	154	0.395	190	0.343	226	0.499	262	0.398	298	0.335
11	0.350	47	0.499	83	0.392	119	0.342	155	0.388	191	0.350	227	0.499	263	0.392	299	0.342
12	0.357	48	0.500	84	0.385	120	0.350	156	0.381	192	0.357	228	0.500	264	0.385	300	0.350
13	0.364	49	0.500	85	0.378	121	0.358	157	0.373	193	0.364	229	0.500	265	0.378	301	0.358
14	0.371	50	0.500	86	0.371	122	0.365	158	0.365	194	0.371	230	0.500	266	0.371	302	0.365
15	0.378	51	0.500	87	0.364	123	0.373	159	0.358	195	0.378	231	0.500	267	0.364	303	0.373
16	0.385	52	0.500	88	0.357	124	0.381	160	0.350	196	0.385	232	0.500	268	0.357	304	0.381
17	0.392	53	0.499	89	0.350	125	0.388	161	0.342	197	0.392	233	0.499	269	0.350	305	0.388
18	0.398	54	0.499	90	0.343	126	0.395	162	0.335	198	0.398	234	0.499	270	0.343	306	0.395
19	0.405	55	0.498	91	0.337	127	0.402	163	0.327	199	0.405	235	0.498	271	0.337	307	0.402
20	0.411	56	0.497	92	0.330	128	0.408	164	0.320	200	0.411	236	0.497	272	0.330	308	0.408
21	0.417	57	0.495	93	0.323	129	0.414	165	0.313	201	0.417	237	0.495	273	0.323	309	0.414
22	0.423	58	0.494	94	0.317	130	0.420	166	0.307	202	0.423	238	0.494	274	0.317	310	0.420
23	0.428	59	0.493	95	0.310	131	0.425	167	0.300	203	0.428	239	0.493	275	0.310	311	0.425
24	0.434	60	0.491	96	0.305	132	0.430	168	0.295	204	0.434	240	0.491	276	0.305	312	0.430
25	0.439	61	0.489	97	0.299	133	0.434	169	0.290	205	0.439	241	0.489	277	0.299	313	0.434
26	0.444	62	0.487	98	0.294	134	0.438	170	0.286	206	0.444	242	0.487	278	0.294	314	0.438
27	0.449	63	0.484	99	0.290	135	0.441	171	0.282	207	0.449	243	0.484	279	0.290	315	0.441
28	0.453	64	0.482	100	0.286	136	0.444	172	0.280	208	0.453	244	0.482	280	0.286	316	0.444
29	0.457	65	0.479	101	0.282	137	0.446	173	0.277	209	0.457	245	0.479	281	0.282	317	0.446
30	0.462	66	0.476	102	0.279	138	0.448	174	0.276	210	0.462	246	0.476	282	0.279	318	0.448
31	0.465	67	0.473	103	0.278	139	0.448	175	0.276	211	0.465	247	0.473	283	0.278	319	0.448
32	0.469	68	0.469	104	0.276	140	0.449	176	0.276	212	0.469	248	0.469	284	0.276	320	0.449
33	0.473	69	0.465	105	0.276	141	0.448	177	0.278	213	0.473	249	0.465	285	0.276	321	0.448
34	0.476	70	0.462	106	0.276	142	0.448	178	0.279	214	0.476	250	0.462	286	0.276	322	0.448
35	0.479	71	0.457	107	0.277	143	0.446	179	0.282	215	0.479	251	0.457	287	0.277	323	0.446

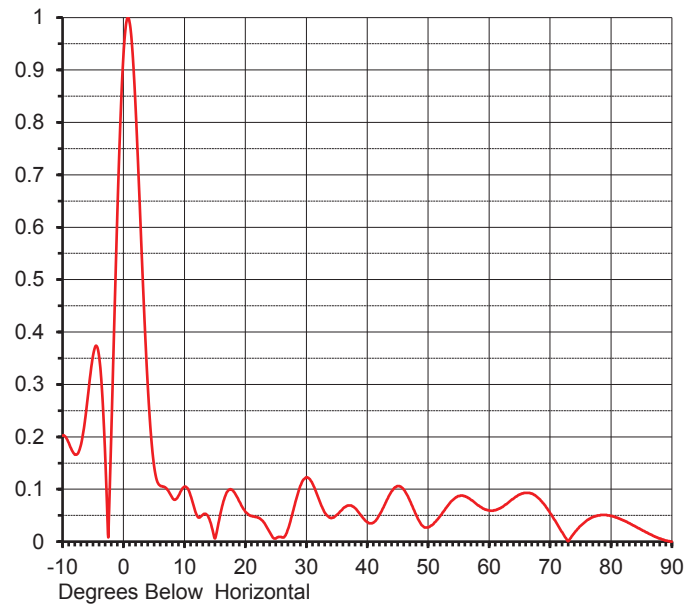
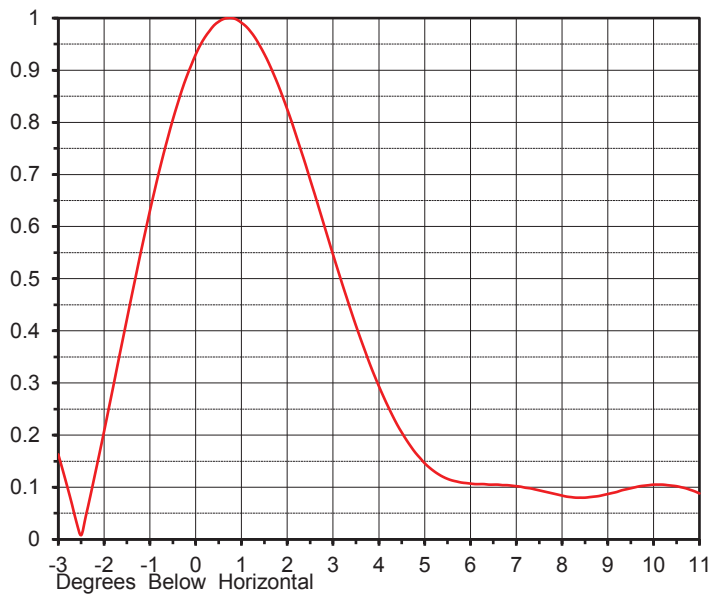
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ELEVATION PATTERN

Proposal No. **C-70003**
 Date **14-Feb-17**
 Call Letters **WZTV 20**
 Frequency **509 MHz**
 Antenna Type **TFU-18DSC/VP-R P230**

RMS Directivity at Main Lobe **15.00 (11.76 dB)**
 RMS Directivity at Horizontal **13.00 (11.14 dB)**
Calculated

Beam Tilt **0.75 deg**
 Drawing Number **18Q150075**



Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.202	10.0	0.105	30.0	0.123	50.0	0.027	70.0	0.055
-9.0	0.189	11.0	0.088	31.0	0.111	51.0	0.036	71.0	0.037
-8.0	0.166	12.0	0.051	32.0	0.083	52.0	0.049	72.0	0.018
-7.0	0.184	13.0	0.051	33.0	0.056	53.0	0.065	73.0	0.001
-6.0	0.262	14.0	0.045	34.0	0.045	54.0	0.079	74.0	0.017
-5.0	0.355	15.0	0.006	35.0	0.051	55.0	0.087	75.0	0.030
-4.0	0.353	16.0	0.058	36.0	0.063	56.0	0.087	76.0	0.040
-3.0	0.163	17.0	0.095	37.0	0.069	57.0	0.080	77.0	0.047
-2.0	0.207	18.0	0.097	38.0	0.064	58.0	0.071	78.0	0.050
-1.0	0.630	19.0	0.077	39.0	0.050	59.0	0.063	79.0	0.051
0.0	0.930	20.0	0.057	40.0	0.037	60.0	0.060	80.0	0.049
1.0	0.991	21.0	0.049	41.0	0.036	61.0	0.060	81.0	0.046
2.0	0.825	22.0	0.046	42.0	0.051	62.0	0.065	82.0	0.041
3.0	0.546	23.0	0.037	43.0	0.074	63.0	0.073	83.0	0.035
4.0	0.294	24.0	0.018	44.0	0.096	64.0	0.082	84.0	0.029
5.0	0.146	25.0	0.006	45.0	0.106	65.0	0.090	85.0	0.023
6.0	0.107	26.0	0.008	46.0	0.099	66.0	0.093	86.0	0.017
7.0	0.102	27.0	0.024	47.0	0.078	67.0	0.092	87.0	0.011
8.0	0.084	28.0	0.066	48.0	0.052	68.0	0.084	88.0	0.006
9.0	0.087	29.0	0.106	49.0	0.031	69.0	0.072	89.0	0.002
								90.0	0.000

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