

12-08. PRANDTL-MEYER ÖSSZEFÜGGÉSEK. ($\gamma=1.4$)

általános esetben:

$$\delta = \sqrt{\frac{\gamma+1}{\gamma-1}} \cdot \operatorname{arctg}\left(\sqrt{\frac{\gamma-1}{\gamma+1}} \cdot \sqrt{M^2-1}\right) - \operatorname{arctg}(\sqrt{M^2-1})$$

$\gamma=1.4$ esetén:

$$\delta = \sqrt{6} \cdot \operatorname{arctg}\left(\frac{\sqrt{M^2-1}}{\sqrt{6}}\right) - \operatorname{arctg}(\sqrt{M^2-1})$$

Minden esetben:

$$\mu = \operatorname{arctg}\left(\frac{1}{\sqrt{M^2-1}}\right)$$

PRANDTL-MEYER ÖSSZEFÜGGÉSEK. ($\gamma=1.4$)

M	δ	μ	M	δ	μ
1.00	0.000000	90.00000	1.35	7.560715	47.79456
1.01	0.044724	81.93069	1.36	7.843498	47.33208
1.02	0.125689	78.63513	1.37	8.127609	46.88029
1.03	0.229428	76.13757	1.38	8.412952	46.43873
<u>1.04</u>	<u>0.350982</u>	<u>74.05763</u>	<u>1.39</u>	<u>8.699448</u>	<u>46.00700</u>
1.05	0.487410	72.24722	1.40	8.987011	45.58471
1.06	0.636686	70.62997	1.41	9.275555	45.17149
1.07	0.797291	69.16032	1.42	9.565010	44.76701
1.08	0.968037	67.80840	1.43	9.855293	44.37094
<u>1.09</u>	<u>1.147945</u>	<u>66.55339</u>	<u>1.44</u>	<u>10.14634</u>	<u>43.98298</u>
1.10	1.336199	65.38003	1.45	10.43810	43.60284
1.11	1.532097	64.27675	1.46	10.73049	43.23024
1.12	1.735039	63.23451	1.47	11.02345	42.86493
1.13	1.944483	62.24609	1.48	11.31693	42.50666
<u>1.14</u>	<u>2.159956</u>	<u>61.30560</u>	<u>1.49</u>	<u>11.61086</u>	<u>42.15520</u>
1.15	2.381037	60.40816	1.50	11.90519	41.81033
1.16	2.607344	59.54970	1.51	12.19989	41.47184
1.17	2.838518	58.72672	1.52	12.49488	41.13953
1.18	3.074249	57.93622	1.53	12.79012	40.81319
<u>1.19</u>	<u>3.314240</u>	<u>57.17564</u>	<u>1.54</u>	<u>13.08558</u>	<u>40.49268</u>
1.20	3.558231	56.44270	1.55	13.38120	40.17778
1.21	3.805954	55.73540	1.56	13.67694	39.86836
1.22	4.057190	55.05200	1.57	13.97277	39.56423
1.23	4.311729	54.39089	1.58	14.26863	39.26526
<u>1.24</u>	<u>4.569347</u>	<u>53.75069</u>	<u>1.59</u>	<u>14.56450</u>	<u>38.97130</u>
1.25	4.829884	53.13012	1.60	14.86034	38.68220
1.26	5.093136	52.52802	1.61	15.15611	38.39784
1.27	5.358959	51.94336	1.62	15.45177	38.11808
1.28	5.627190	51.37518	1.63	15.74733	37.84280
<u>1.29</u>	<u>5.897671</u>	<u>50.82262</u>	<u>1.64</u>	<u>16.04269</u>	<u>37.57188</u>
1.30	6.170280	50.28487	1.65	16.33787	37.30521
1.31	6.444866	49.76121	1.66	16.63282	37.04269
1.32	6.721325	49.25096	1.67	16.92753	36.78419
1.33	6.999523	48.75348	1.68	17.22197	36.52962
1.34	7.279362	48.26820	1.69	17.51609	36.27889

PRANDTL-MEYER ÖSSZEFÜGGÉSEK. ($\gamma=1.4$)

M	δ	μ	M	δ	μ
1.70	17.80989	36.03189	2.05	27.74834	29.19642
1.71	18.10334	35.78855	2.06	28.01970	29.04112
1.72	18.39641	35.54876	2.07	28.29026	28.88754
1.73	18.68909	35.31245	2.08	28.55999	28.73567
<u>1.74</u>	<u>18.98135</u>	<u>35.07952</u>	<u>2.09</u>	<u>28.82894</u>	<u>28.58546</u>
1.75	19.27317	34.84992	2.10	29.09705	28.43690
1.76	19.56453	34.62355	2.11	29.36435	28.28996
1.77	19.85542	34.40034	2.12	29.63082	28.14460
1.78	20.14582	34.18023	2.13	29.89647	28.00079
<u>1.79</u>	<u>20.43569</u>	<u>33.96314</u>	<u>2.14</u>	<u>30.16127</u>	<u>27.85852</u>
1.80	20.72503	33.74900	2.15	30.42524	27.71776
1.81	21.01384	33.53776	2.16	30.68839	27.57848
1.82	21.30209	33.32934	2.17	30.95066	27.44066
1.83	21.58976	33.12369	2.18	31.21212	27.30427
<u>1.84</u>	<u>21.87682</u>	<u>32.92075</u>	<u>2.19</u>	<u>31.47271</u>	<u>27.16930</u>
1.85	22.16330	32.72046	2.20	31.73246	27.03571
1.86	22.44914	32.52276	2.21	31.99136	26.90348
1.87	22.73436	32.32761	2.22	32.24939	26.77260
1.88	23.01894	32.13494	2.23	32.50659	26.64304
<u>1.89</u>	<u>23.30286</u>	<u>31.94471</u>	<u>2.24</u>	<u>32.76292</u>	<u>26.51479</u>
1.90	23.58611	31.75688	2.25	33.01838	26.38781
1.91	23.86869	31.57138	2.26	33.27298	26.26210
1.92	24.15057	31.38818	2.27	33.52672	26.13763
1.93	24.43176	31.20723	2.28	33.77960	26.01438
<u>1.94</u>	<u>24.71224</u>	<u>31.02848</u>	<u>2.29</u>	<u>34.03162</u>	<u>25.89233</u>
1.95	24.99199	30.85190	2.30	34.28277	25.77147
1.96	25.27104	30.67744	2.31	34.53304	25.65178
1.97	25.54932	30.50506	2.32	34.78246	25.53324
1.98	25.82688	30.33472	2.33	35.03100	25.41583
<u>1.99</u>	<u>26.10369</u>	<u>30.16638</u>	<u>2.34</u>	<u>35.27867</u>	<u>25.29954</u>
2.00	26.37974	30.00001	2.35	35.52549	25.18435
2.01	26.65501	29.83557	2.36	35.77142	25.07024
2.02	26.92952	29.67303	2.37	36.01650	24.95720
2.03	27.20325	29.51234	2.38	36.26070	24.84521
2.04	27.47620	29.35349	2.39	36.50404	24.73426

PRANDTL-MEYER ÖSSZEFÜGGÉSEK. ($\gamma=1.4$)

M	δ	μ	M	δ	μ
2.40	36.74650	24.62433	2.75	44.69380	21.32370
2.41	36.98809	24.51541	2.76	44.90582	21.24269
2.42	37.22882	24.40748	2.77	45.11705	21.16230
2.43	37.46868	24.30053	2.78	45.32745	21.08253
<u>2.44</u>	<u>37.70768</u>	<u>24.19455</u>	<u>2.79</u>	<u>45.53706</u>	<u>21.00339</u>
2.45	37.94581	24.08952	2.80	45.74585	20.92484
2.46	38.18309	23.98543	2.81	45.95386	20.84690
2.47	38.41950	23.88226	2.82	46.16105	20.76955
2.48	38.65503	23.78001	2.83	46.36746	20.69279
<u>2.49</u>	<u>38.88971</u>	<u>23.67866</u>	<u>2.84</u>	<u>46.57307</u>	<u>20.61660</u>
2.50	39.12353	23.57819	2.85	46.77790	20.54099
2.51	39.35649	23.47861	2.86	46.98194	20.46594
2.52	39.58859	23.37988	2.87	47.18519	20.39145
2.53	39.81984	23.28201	2.88	47.38766	20.31752
<u>2.54</u>	<u>40.05022</u>	<u>23.18498</u>	<u>2.89</u>	<u>47.58935</u>	<u>20.24413</u>
2.55	40.27976	23.08879	2.90	47.79028	20.17128
2.56	40.50844	22.99341	2.91	47.99041	20.09897
2.57	40.73627	22.89884	2.92	48.18979	20.02719
2.58	40.96326	22.80507	2.93	48.38840	19.95592
<u>2.59</u>	<u>41.18939</u>	<u>22.71208</u>	<u>2.94</u>	<u>48.58623</u>	<u>19.88518</u>
2.60	41.41467	22.61988	2.95	48.78329	19.81494
2.61	41.63911	22.52844	2.96	48.97961	19.74521
2.62	41.86272	22.43776	2.97	49.17517	19.67598
2.63	42.08548	22.34783	2.98	49.36996	19.60724
<u>2.64</u>	<u>42.30740</u>	<u>22.25863</u>	<u>2.99</u>	<u>49.56400</u>	<u>19.53900</u>
2.65	42.52849	22.17017	3.00	49.75731	19.47123
2.66	42.74875	22.08243	3.01	49.94986	19.40395
2.67	42.96816	21.99539	3.02	50.14166	19.33714
2.68	43.18675	21.90906	3.03	50.33274	19.27079
<u>2.69</u>	<u>43.40451</u>	<u>21.82343</u>	<u>3.04</u>	<u>50.52307</u>	<u>19.20491</u>
2.70	43.62145	21.73847	3.05	50.71266	19.13949
2.71	43.83754	21.65420	3.06	50.90153	19.07452
2.72	44.05286	21.57059	3.07	51.08966	19.00999
2.73	44.26731	21.48764	3.08	51.27707	18.94592
2.74	44.48096	21.40535	3.09	51.46376	18.88228

PRANDTL-MEYER ÖSSZEFÜGGÉSEK. ($\gamma=1.4$)

M	δ	μ	M	δ	μ
3.10	51.64970	18.81907	3.45	57.72633	16.84929
3.11	51.83496	18.75630	3.46	57.88824	16.79915
3.12	52.01948	18.69395	3.47	58.04952	16.74930
3.13	52.20329	18.63202	3.48	58.21021	16.69976
<u>3.14</u>	<u>52.38640</u>	<u>18.57051</u>	<u>3.49</u>	<u>58.37028</u>	<u>16.65051</u>
3.15	52.56881	18.50942	3.50	58.52972	16.60156
3.16	52.75049	18.44873	3.51	58.68857	16.55290
3.17	52.93150	18.38844	3.52	58.84682	16.50453
3.18	53.11179	18.32856	3.53	59.00446	16.45644
<u>3.19</u>	<u>53.29139</u>	<u>18.26907</u>	<u>3.54</u>	<u>59.16151</u>	<u>16.40864</u>
3.20	53.47031	18.20997	3.55	59.31797	16.36111
3.21	53.64852	18.15126	3.56	59.47383	16.31387
3.22	53.82605	18.09293	3.57	59.62910	16.26690
3.23	54.00290	18.03499	3.58	59.78380	16.22021
<u>3.24</u>	<u>54.17907</u>	<u>17.97742</u>	<u>3.59</u>	<u>59.93789</u>	<u>16.17378</u>
3.25	54.35455	17.92023	3.60	60.09141	16.12763
3.26	54.52938	17.86340	3.61	60.24435	16.08174
3.27	54.70351	17.80694	3.62	60.39674	16.03612
3.28	54.87699	17.75084	3.63	60.54852	15.99076
<u>3.29</u>	<u>55.04979</u>	<u>17.69510</u>	<u>3.64</u>	<u>60.69975</u>	<u>15.94565</u>
3.30	55.22193	17.63971	3.65	60.85040	15.90081
3.31	55.39342	17.58468	3.66	61.00050	15.85622
3.32	55.56424	17.52999	3.67	61.15000	15.81188
3.33	55.73441	17.47565	3.68	61.29898	15.76779
<u>3.34</u>	<u>55.90392</u>	<u>17.42165</u>	<u>3.69</u>	<u>61.44740</u>	<u>15.72395</u>
3.35	56.07278	17.36799	3.70	61.59524	15.68036
3.36	56.24101	17.31466	3.71	61.74253	15.63701
3.37	56.40858	17.26167	3.72	61.88929	15.59391
3.38	56.57553	17.20900	3.73	62.03548	15.55104
<u>3.39</u>	<u>56.74181</u>	<u>17.15666</u>	<u>3.74</u>	<u>62.18113</u>	<u>15.50841</u>
3.40	56.90746	17.10464	3.75	62.32625	15.46602
3.41	57.07250	17.05295	3.76	62.47082	15.42386
3.42	57.23689	17.00156	3.77	62.61485	15.38194
3.43	57.40067	16.95050	3.78	62.75837	15.34024
3.44	57.56381	16.89974	3.79	62.90133	15.29877

PRANDTL-MEYER ÖSSZEFÜGGÉSEK. ($\gamma=1.4$)

M	δ	μ	M	δ	μ
3.80	63.04376	15.25753	4.15	67.71323	13.94343
3.81	63.18567	15.21652	4.16	67.83814	13.90924
3.82	63.32705	15.17572	4.17	67.96257	13.87521
3.83	63.46792	15.13515	4.18	68.08657	13.84136
<u>3.84</u>	<u>63.60825</u>	<u>15.09480</u>	<u>4.19</u>	<u>68.21014</u>	<u>13.80767</u>
3.85	63.74807	15.05466	4.20	68.33326	13.77414
3.86	63.88738	15.01474	4.21	68.45593	13.74078
3.87	64.02617	14.97503	4.22	68.57819	13.70758
3.88	64.16444	14.93554	4.23	68.69998	13.67454
<u>3.89</u>	<u>64.30220</u>	<u>14.89625</u>	<u>4.24</u>	<u>68.82139</u>	<u>13.64167</u>
3.90	64.43947	14.85717	4.25	68.94231	13.60895
3.91	64.57624	14.81831	4.26	69.06284	13.57639
3.92	64.71249	14.77964	4.27	69.18294	13.54399
3.93	64.84826	14.74118	4.28	69.30261	13.51174
<u>3.94</u>	<u>64.98352</u>	<u>14.70292</u>	<u>4.29</u>	<u>69.42186</u>	<u>13.47965</u>
3.95	65.11829	14.66486	4.30	69.54067	13.44771
3.96	65.25256	14.62700	4.31	69.65908	13.41593
3.97	65.38634	14.58934	4.32	69.77706	13.38429
3.98	65.51964	14.55187	4.33	69.89465	13.35281
<u>3.99</u>	<u>65.65245</u>	<u>14.51460</u>	<u>4.34</u>	<u>70.01182</u>	<u>13.32148</u>
4.00	65.78478	14.47752	4.35	70.12856	13.29029
4.01	65.91663	14.44063	4.36	70.24493	13.25925
4.02	66.04800	14.40393	4.37	70.36085	13.22835
4.03	66.17890	14.36742	4.38	70.47639	13.19761
<u>4.04</u>	<u>66.30931</u>	<u>14.33109</u>	<u>4.39</u>	<u>70.59151</u>	<u>13.16700</u>
4.05	66.43926	14.29495	4.40	70.70623	13.13654
4.06	66.56873	14.25900	4.41	70.82056	13.10622
4.07	66.69775	14.22322	4.42	70.93449	13.07604
4.08	66.82629	14.18763	4.43	71.04802	13.04600
<u>4.09</u>	<u>66.95439</u>	<u>14.15222</u>	<u>4.44</u>	<u>71.16116</u>	<u>13.01610</u>
4.10	67.08198	14.11698	4.45	71.27393	12.98634
4.11	67.20914	14.08192	4.46	71.38628	12.95671
4.12	67.33585	14.04704	4.47	71.49825	12.92722
4.13	67.46210	14.01233	4.48	71.60982	12.89787
4.14	67.58789	13.97780	4.49	71.72102	12.86865

PRANDTL-MEYER ÖSSZEFÜGGÉSEK. ($\gamma=1.4$)

M	δ	μ	M	δ	μ
4.50	71.83183	12.83956	4.80	74.98643	12.02466
4.51	71.94227	12.81061	4.81	75.08619	11.99929
4.52	72.05233	12.78179	4.82	75.18562	11.97402
4.53	72.16199	12.75309	4.83	75.28473	11.94886
<u>4.54</u>	<u>72.27129</u>	<u>12.72453</u>	<u>4.84</u>	<u>75.38349</u>	<u>11.92381</u>
4.55	72.38021	12.69610	4.85	75.48193	11.89887
4.56	72.48876	12.66779	4.86	75.58006	11.87403
4.57	72.59695	12.63961	4.87	75.67786	11.84929
4.58	72.70475	12.61156	4.88	75.77533	11.82466
<u>4.59</u>	<u>72.81218</u>	<u>12.58363</u>	<u>4.89</u>	<u>75.87247</u>	<u>11.80013</u>
4.60	72.91927	12.55583	4.90	75.96931	11.77570
4.61	73.02599	12.52815	4.91	76.06583	11.75137
4.62	73.13234	12.50059	4.92	76.16203	11.72715
4.63	73.23833	12.47316	4.93	76.25792	11.70302
<u>4.64</u>	<u>73.34395</u>	<u>12.44584</u>	<u>4.94</u>	<u>76.35350</u>	<u>11.67900</u>
4.65	73.44922	12.41865	4.95	76.44873	11.65507
4.66	73.55413	12.39157	4.96	76.54370	11.63125
4.67	73.65869	12.36462	4.97	76.63835	11.60752
4.68	73.76290	12.33778	4.98	76.73265	11.58389
<u>4.69</u>	<u>73.86674</u>	<u>12.31106</u>	<u>4.99</u>	<u>76.82668</u>	<u>11.56035</u>
4.70	73.97026	12.28446	5.00	76.92039	11.53691
4.71	74.07341	12.25797	5.50	81.24477	10.47568
4.72	74.17622	12.23160	6.00	84.95550	9.59406
4.73	74.27869	12.20534	6.50	88.16815	8.84988
<u>4.74</u>	<u>74.38081</u>	<u>12.17919</u>	<u>7.00</u>	<u>90.97274</u>	<u>8.21321</u>
4.75	74.48260	12.15316	7.50	93.43968	7.66225
4.76	74.58403	12.12724	8.00	95.62466	7.18075
4.77	74.68513	12.10143	8.50	97.57222	6.75632
4.78	74.78590	12.07573	9.00	99.31809	6.37937
4.79	74.88632	12.05014	10.00	100.8915	6.04232