



11- Тригонометр (дунд шат) Илэрхийлэл ямар тэмдэгтэй вэ?

1. $\sin 250^\circ \times \cos 100^\circ =$
2. $\operatorname{tg}(-70^\circ) \times \sin 10^\circ =$
3. $\sin 184^\circ \times \cos(-20^\circ) =$
4. $\cos 195^\circ \times \operatorname{tg} 330^\circ =$
5. $\operatorname{tg}(-155^\circ) \times \cos(-140^\circ) =$
6. $\operatorname{tg}(-365^\circ) \times \cos(-200^\circ) =$
7. $\sin(-278^\circ) \times \cos(-345^\circ) =$
8. $\cos 193^\circ \times \operatorname{tg} 202^\circ =$

Утгыг олоорой.

1. $\sin 450^\circ =$
2. $\sin 300^\circ =$
3. $\cos(-120^\circ) =$
4. $\cos 480^\circ =$
5. $\operatorname{tg} 1350^\circ =$
6. $\operatorname{tg}(-2100^\circ) =$
7. $\operatorname{ctg} 1650^\circ =$
8. $\operatorname{ctg}(-630^\circ) =$
9. $\sin^2\left(\pi + \frac{\pi}{3}\right) =$
10. $\cos^2\left(\frac{3\pi}{2} - \frac{\pi}{4}\right) =$
11. $\operatorname{tg}^2\left(\frac{\pi}{2} + \frac{\pi}{6}\right) =$
12. $\operatorname{ctg}^2\left(2\pi - \frac{\pi}{3}\right) =$

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1. $\sin(-590^\circ) =$
2. $\cos(-320^\circ) =$
3. $\operatorname{ctg} 130^\circ =$
4. $\operatorname{tg}\left(-\frac{9\pi}{5}\right) =$
5. $\operatorname{ctg}\left(-\frac{3\pi}{5}\right) =$

Илэрхийллийг хаялбарчлаарай.

1. $5\cos 90^\circ + 6\sin 45^\circ + 3\operatorname{ctg} 90^\circ =$
2. $\operatorname{ctg} 120^\circ \times \sin 120^\circ =$
3. $\sin 360^\circ + \cos 180^\circ - \operatorname{tg} 360^\circ =$
4. $4\operatorname{tg} 45^\circ \times \sin 30^\circ =$
5. $5\cos 60^\circ - \cos 45^\circ + \sin 90^\circ =$
6. $3\operatorname{tg}\frac{\pi}{4} \times \operatorname{tg}\frac{\pi}{3} =$
7. $12\sin\frac{\pi}{3} \times \cos\frac{\pi}{3} =$
8. $5\sin(-60^\circ) - 6\operatorname{ctg} 150^\circ =$
9. $\sqrt{3}\operatorname{tg} 30^\circ + \sqrt{2}\sin(-45^\circ) =$
10. $\cos 765^\circ \times \sin\frac{19\pi}{6} =$
11. $\sin\left(\pi + \frac{\pi}{6}\right) + \operatorname{tg}\left(\frac{\pi}{3} - \pi\right) =$
12. $\sin 105^\circ - \cos 165^\circ =$
13. $3\cos 0^\circ - 4\sin 0^\circ + 6\operatorname{tg} 0^\circ =$

14. $\sin 180^\circ \times \operatorname{tg} 45^\circ + \cos 180^\circ \times \operatorname{ctg} 45^\circ =$
15. $\sin 90^\circ + \cos 45^\circ + \operatorname{tg} 60^\circ =$
16. $\cos 180^\circ + \sin 45^\circ + \operatorname{tg} 30^\circ =$
17. $\alpha = 990^\circ$ бол $\sin \alpha = ?$ $\cos \alpha = ?$
 $\operatorname{tg} \alpha = ?$ $\operatorname{ctg} \alpha = ?$
18. $\alpha = 60^\circ$ бол $\sin 2\alpha + \cos \alpha = ?$
19. $\alpha = 45^\circ$ бол $\cos 2\alpha - \operatorname{tg} \alpha = ?$
20. $\alpha = 15^\circ$ бол $\operatorname{tg} 3\alpha + \sin 2\alpha = ?$
21. $\alpha = 60^\circ$ бол $\cos 2\alpha - \sin 3\alpha = ?$
22. $\alpha = 50^\circ$ бол $\sin 3\alpha + \cos 3\alpha = ?$
23. $\alpha = 30^\circ$ бол $4\sin 2\alpha - 3\operatorname{tg} 2\alpha = ?$
24. $180^\circ < \alpha < 270^\circ$ ба $\operatorname{tg} \alpha = -\frac{3}{5}$ бол
 $\sin \alpha = ?$ $\cos \alpha = ?$ $\operatorname{ctg} \alpha = ?$
25. $90^\circ < \alpha < 180^\circ$ ба $\operatorname{tg} \alpha = 0.75$ бол
 $\sin \alpha = ?$ $\cos \alpha = ?$ $\operatorname{ctg} \alpha = ?$
26. $90^\circ < \alpha < 180^\circ$ ба $\cos \alpha = -\frac{15}{17}$
бол $\sin \alpha = ?$ $\operatorname{tg} \alpha = ?$ $\operatorname{ctg} \alpha = ?$
27. $0^\circ < \alpha < 90^\circ$ ба $\sin \alpha = \frac{12}{13}$ бол
 $\operatorname{tg} \alpha = ?$ $\cos \alpha = ?$ $\operatorname{ctg} \alpha = ?$
28. $0^\circ < \alpha < 90^\circ$ ба $\sin \alpha = \frac{2\sqrt{2}}{3}$ бол
 $12\cos \alpha - 4.5 = ?$
29. $0^\circ < \alpha < 90^\circ$ ба $\cos \alpha = \frac{4\sqrt{3}}{7}$ бол
 $3.5\sin \alpha - 1.5 = ?$
30. $\sin \alpha \times \cos \alpha = 0.5$ бол $\sin^4 \alpha + \cos^4 \alpha = ?$
31. $\cos\left(\frac{\pi}{2} + \frac{\pi}{3}\right) \times \sin\left(\frac{3\pi}{2} + \frac{\pi}{3}\right) \times \operatorname{ctg}\left(\frac{\pi}{2} + \frac{\pi}{3}\right) =$
32. $(1 + \cos 2\alpha) \times \operatorname{tg}^2(\pi - \alpha) =$
33. $\cos\left(\frac{3\pi}{2} + \alpha\right) \times \sin(\pi - \alpha) =$
34. $\sin\left(\pi - \frac{\pi}{3}\right) \times \cos\left(2\pi - \frac{\pi}{3}\right) =$
35. $\sin\left(\frac{\pi}{2} + \frac{\pi}{6}\right) \times \sin\left(\frac{\pi}{2} - \frac{\pi}{3}\right) =$
36. $\sin(\pi - \alpha) \times \cos\left(\frac{\pi}{2} - \alpha\right) =$
37. $\operatorname{tg}\left(\frac{\pi}{2} + \frac{\pi}{6}\right) \times \operatorname{ctg}\left(\frac{\pi}{2} - \frac{\pi}{3}\right) =$
38. $3\operatorname{tg}\left(\pi - \frac{\pi}{3}\right) \times \sin\left(2\pi + \frac{\pi}{4}\right) =$
39. $\sqrt{3}\operatorname{ctg}\left(\pi + \frac{\pi}{6}\right) + \cos\left(2\pi - \frac{\pi}{3}\right) =$
40. $\sin\left(\frac{3\pi}{2} - \frac{\pi}{3}\right) + \cos\left(\frac{3\pi}{2} - \frac{\pi}{6}\right) =$
41. $\frac{1}{\cos^2 \alpha} + \frac{1}{\sin^2 \alpha} =$
42. $\frac{1}{1 + \sin \alpha} + \frac{1}{1 - \sin \alpha} =$
43. $\frac{\sin^2 x}{1 - \cos x} =$
44. $\frac{\sin^2 x - 1}{\cos^2 x - 1} =$
45. $\frac{1}{1 - \sin x} - \frac{\sin x}{1 - \sin^2 x} - \frac{1}{1 + \sin x} =$
46. $\frac{1 - \cos 2x}{\sin 2x} + \frac{\sin 2x}{1 + \cos 2x} =$
47. $\frac{\sin 30^\circ + \operatorname{tg} 45^\circ - \operatorname{cosec} 60^\circ}{\cos 45^\circ + \cos 60^\circ - \sec 30^\circ} =$
48. $\cos 12^\circ - \sin 78^\circ =$

49. $\frac{\operatorname{tg}36^\circ}{\cos54^\circ} =$
50. $\operatorname{cosec}31^\circ - \operatorname{sec}59^\circ =$
51. $\sin15^\circ \times \operatorname{sec}75^\circ =$
52. $\operatorname{tg}26^\circ \times \operatorname{tg}64^\circ =$
53. $\operatorname{tg}48^\circ \times \operatorname{tg}16^\circ \times \operatorname{tg}42^\circ \times \operatorname{tg}74^\circ =$
54. $\cos36^\circ \times \cos54^\circ - \sin36^\circ \times \sin54^\circ =$
55. $\operatorname{tg}48^\circ \times \operatorname{tg}23^\circ \times \operatorname{tg}42^\circ \times \operatorname{tg}67^\circ =$
56. $\cos38^\circ \times \cos52^\circ - \sin38^\circ \times \sin52^\circ =$
57. $\left(\frac{\sin27^\circ}{\cos63^\circ}\right)^2 + \left(\frac{\cos63^\circ}{\sin27^\circ}\right)^2 =$
58. $\frac{\cos45^\circ}{\sec30^\circ + \operatorname{cosec}30^\circ} =$
59. $\frac{2\operatorname{tg}30^\circ}{1 + \operatorname{tg}^230^\circ} =$
60. $\frac{5\cos^260^\circ + 5\sec^230^\circ - \operatorname{tg}^245^\circ}{\sin^230^\circ + \cos^230^\circ} =$
61. $\sin^2\frac{\pi}{6} + \cos^2\frac{\pi}{3} - \operatorname{tg}^2\frac{\pi}{4} =$
62. $\cos^2\frac{\pi}{6} + \operatorname{cosec}\frac{5\pi}{6} + 3\operatorname{tg}^2\frac{\pi}{6} =$
63. $\frac{\cos(\pi+x) \times \cos(-x)}{\sin(\pi-x) \times \cos(\frac{\pi}{2}+x)} =$
64. $\cos\left(\frac{3\pi}{2} + x\right) \times \cos(2\pi + x) \times$
 $\left[\operatorname{tg}\left(\frac{3\pi}{2} - x\right) + \operatorname{ctg}(2\pi + x)\right] =$
65. $\sin\left(\frac{\pi}{2} - x\right) + \cos(\pi + x) + \operatorname{tg}\left(\frac{3\pi}{2} +$
 $x\right) + \operatorname{ctg}(2\pi + x) =$
66. $\sin\left(\frac{\pi}{2} + x\right) - \cos(x - \pi) + \operatorname{tg}(\pi -$
 $x) + \operatorname{ctg}\left(\frac{5\pi}{2} + x\right) =$
67. $\sin\left(\frac{3\pi}{2} - x\right) - \cos\left(\frac{\pi}{2} - x\right) +$
 $\sin(-x) + \cos(-x) =$
68. $\sin^2\left(\frac{\pi}{2} - x\right) + \sin^2\left(\frac{3\pi}{2} - x\right) =$
69. $\cos^2(\pi + x) + \cos^2\left(\frac{\pi}{2} + x\right) =$
70. $\frac{\cos(-x) \times \cos(180^\circ + x)}{\sin(-x) \times \sin(90^\circ + x)} =$
71. $\cos\alpha + \sin\alpha \times \operatorname{tg}\alpha =$
72. $\frac{\cos\alpha}{1 + \sin\alpha} + \frac{\cos\alpha}{1 - \sin\alpha} =$
73. $2\cos^2\alpha - 2 =$
74. $\operatorname{tg}\beta \times \operatorname{ctg}\beta + 1 =$
75. $3 - \sin^2\alpha - \cos^2\alpha =$
76. $\cos^4\alpha - \sin^4\alpha =$
77. $\frac{1 + \sin2\beta}{\sin\beta + \cos\beta} =$
78. $\frac{1 - \sin2\beta}{\sin\beta - \cos\beta} =$
79. $(\operatorname{ctg}^2\alpha - \cos^2\alpha) \times \operatorname{tg}^2\alpha =$
80. $(1 + \operatorname{ctg}^2\alpha) \times \sin^2\alpha - \cos^2\alpha =$
81. $(1 + \operatorname{tg}^2\alpha) \times \cos^2\alpha - \sin^2\alpha =$
82. $1 - \cos2x =$
83. $2\sin^2\alpha \times \cos^2\alpha + \cos^4\alpha + \sin^4\alpha =$
84. $\frac{\cos\alpha}{1 + \sin\alpha} + \operatorname{tg}\alpha =$
85. $\operatorname{ctg}\alpha - \frac{\cos\alpha}{1 + \sin\alpha} =$
86. $\frac{\sin^2x}{\cos x - 1} =$
87. $(\sin\alpha + \cos\alpha)^2 - 1 =$
88. $1 - \sin^2\alpha + \operatorname{tg}^2\alpha \times \cos^2\alpha =$
89. $\frac{\sin\alpha}{1 - \cos\alpha} + \frac{1 - \cos\alpha}{\sin\alpha} =$
90. $\frac{\sin x + \operatorname{tg}x}{1 + \cos x} =$
91. $\frac{\sin^2\alpha + 2\cos^2\alpha - 1}{\operatorname{ctg}^2\alpha} =$
92. $\sin^2\alpha \times \operatorname{ctg}^2\alpha + \sin^2\alpha =$
93. $\cos^2\beta + \sin^2\beta - \sin^2\alpha =$
94. $\sin^2\beta + \cos^2\beta + \operatorname{tg}^2\beta =$
95. $(\sin\alpha \times \operatorname{ctg}\alpha)^2 + (\cos\alpha \times \operatorname{tg}\alpha)^2 =$
96. $1 - \operatorname{tg}^2\alpha \times (1 - \sin^2\alpha) =$
97. $\cos^2\alpha \times \operatorname{tg}^2\alpha + \cos^2\alpha =$
98. $1 - \frac{1}{\sin^2x} =$
99. $1 + \frac{\operatorname{tg}\alpha}{\operatorname{ctg}\alpha} =$
100. $\frac{1 - \cos^2x}{1 - \sin^2x} - 1 =$
101. $\operatorname{tg}\alpha \times \operatorname{ctg}\alpha - \cos^2\alpha =$
102. $\frac{1 + \operatorname{tg}^2x}{1 + \operatorname{ctg}^2x} =$
103. $\cos^4\alpha - \cos^2\alpha + \sin^2\alpha =$
104. $\cos^2\alpha + 2\sin^2\alpha - 1 =$
105. $\frac{\cos^2\alpha}{1 - \cos^2\alpha} \times \operatorname{tg}^2\alpha =$
106. $\frac{1}{\operatorname{ctg}^2\alpha + 1} \times \operatorname{ctg}^2\alpha =$
107. $\frac{1 - \cos^2\alpha + \operatorname{tg}^2\alpha \times \cos^2\alpha}{\sin^2\alpha} =$
108. $\operatorname{tg}4\alpha \times \operatorname{ctg}4\alpha - (\sin2\alpha \times$
 $\operatorname{ctg}2\alpha)^2 =$
109. $2 - \sin^2\alpha - 2\cos^2\alpha =$
110. $\operatorname{tg}\beta \times \operatorname{ctg}\beta - \frac{1}{\cos^2\beta} =$
111. $\frac{\sin^2\alpha}{1 + \operatorname{ctg}^2\alpha \times (\cos^2\alpha - 1)} =$
112. $\left(\frac{1}{\cos x} + \operatorname{tg}x\right) \left(\frac{1}{\cos x} - \operatorname{tg}x\right) =$
113. $\frac{1}{\cos^2\alpha} - \operatorname{tg}^2\alpha \times (\cos^2\alpha +$
 $1) =$
114. $(\sin\alpha + \cos\alpha)^2 + (\sin\alpha -$
 $\cos\alpha)^2 =$
115. $(\operatorname{tg}\alpha + \operatorname{ctg}\alpha)^2 - (\operatorname{tg}\alpha -$
 $\operatorname{ctg}\alpha)^2 =$
116. $\cos^2\alpha + \sin^2\alpha \times \cos^2\alpha +$
 $\sin^4\alpha =$
117. $\sin^4\alpha + \cos^2\alpha - \cos^4\alpha =$
118. $\frac{1 + \operatorname{tg}x}{1 + \operatorname{ctg}x} =$