TRIGONOMETRIYA

TRIGONOMETRIK FORMULALAR

#	FORMULA
1	$sin^2x + cos^2x = 1$
2	$sin^2x = 1 - cos^2x$
3	$sinx = \pm\sqrt{1-cos^2x} = \dfrac{tgx}{\pm\sqrt{1+tg^2x}} = \dfrac{1}{\pm\sqrt{1+ctg^2x}}$
4	$cos^2x = 1 - sin^2x$
5	$cosx = \pm\sqrt{1-sin^2x} = \dfrac{ctgx}{\pm\sqrt{1+ctg^2x}} = \dfrac{1}{\pm\sqrt{1+tg^2x}}$
6	$cos^2x - sin^2x = cos2x$
7	$1 - cos2x = 2sin^2x$
8	$cos2x = 1 - 2sin^2x$
9	$sin^2x = \dfrac{1-cos2x}{2}$
10	$sinx = \pm\sqrt{\dfrac{1-cos2x}{2}}$
11	$1 + cos2x = 2cos^2x$
12	$cos2x = 2cos^2x - 1$
13	$cos^2x = \dfrac{1+cos2x}{2}$
14	$cosx = \pm\sqrt{\dfrac{1+cos2x}{2}}$
15	$sin^4x = 1 - 2cos^2x + cos^4x$
16	$cos^4x = 1 - 2sin^2x + sin^4x$
17	$cos^4x + sin^4x = 1 - 2sin^2xcos^2x$
18	$cos^4x + sin^4x = 1 - \dfrac{1}{2}sin^22x$
19	$cos^4x - sin^4x = cos2x$
20	$cos^6x + sin^6x = 1 - 3sin^2xcos^2x$
21	$cos^6x + sin^6x = 1 - \dfrac{3}{4}sin^22x$
22	$cos^6x - sin^6x = cos2x(1 - \dfrac{1}{4}sin^22x)$
23	$cos^8x + sin^8x = (1 - \dfrac{1}{2}sin^22x)^2 - \dfrac{1}{8}sin^42x$
24	$cos^8x - sin^8x = cos2x(1 - \dfrac{1}{2}sin^22x)$
25	$\sin(x+y) = sinx \cdot cosy + siny \cdot cosx$
26	$\sin(x-y) = sinx \cdot cosy - siny \cdot cosx$
27	$\cos(x+y) = cosx \cdot cosy - sinx \cdot siny$
28	$\cos(x-y) = cosx \cdot cosy + sinx \cdot siny$
29	$sin^2x - sin^2y = \sin(x+y)\sin(x-y)$
30	$cos^2x - cos^2y = -\sin(x+y)\sin(x-y)$
31	$sinx + cosx = \sqrt{2}sin\left(x+\dfrac{\pi}{4}\right)$
32	$sinx + cosx = \sqrt{2}cos\left(x-\dfrac{\pi}{4}\right)$
33	$cosx - sinx = \sqrt{2}sin\left(\dfrac{\pi}{4}-x\right)$
34	$cosx - sinx = \sqrt{2}cos\left(\dfrac{\pi}{4}+x\right)$
35	$sinx + \sqrt{3}cosx = 2sin\left(x+\dfrac{\pi}{3}\right)$
36	$sinx + \sqrt{3}cosx = 2cos\left(x-\dfrac{\pi}{6}\right)$
37	$cosx + \sqrt{3}sinx = 2sin\left(x+\dfrac{\pi}{6}\right)$
38	$cosx + \sqrt{3}sinx = 2cos\left(x-\dfrac{\pi}{3}\right)$
39	$sinx - \sqrt{3}cosx = 2sin\left(x-\dfrac{\pi}{3}\right)$
40	$sinx - \sqrt{3}cosx = -2cos\left(x+\dfrac{\pi}{6}\right)$
41	$\sqrt{3}sinx - cosx = 2sin\left(x-\dfrac{\pi}{6}\right)$
42	$\sqrt{3}sinx - cosx = -2cos\left(x+\dfrac{\pi}{3}\right)$
43	$sinx + siny = 2sin\dfrac{x+y}{2}cos\dfrac{x-y}{2}$
44	$sinx - siny = 2sin\dfrac{x-y}{2}cos\dfrac{x+y}{2}$
45	$cosx + cosy = 2cos\dfrac{x+y}{2}cos\dfrac{x-y}{2}$
46	$cosx - cosy = -2sin\dfrac{x+y}{2}sin\dfrac{x-y}{2}$

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47	$sinx \cdot siny = \frac{1}{2}(\cos(x-y) - \cos(x+y))$	71	$cos^2 nx = \dfrac{1+cos2nx}{2}$
48	$cosx \cdot cosy = \frac{1}{2}(\cos(x-y) + \cos(x+y))$	72	$cos^2 x = \dfrac{1+cos2x}{2}$
49	$sinx \cdot cosy = \frac{1}{2}(\sin(x-y) + \sin(x+y))$	73	$cos^2 2x = \dfrac{1+cos4x}{2}$
50	$sin2x = 2sinx \cdot cosx$	74	$cos^2 3x = \dfrac{1+cos6x}{2}$
51	$sinx \cdot cosx = \frac{1}{2}sin2x$	75	$cos^2 4x = \dfrac{1+cos8x}{2}$
52	$(sinx + cosx)^2 = 1 + sin2x$	76	$cos^2 \frac{x}{2} = \dfrac{1+cosx}{2}$
53	$(sinx - cosx)^2 = 1 - sin2x$	77	$cos^2 \frac{x}{4} = \dfrac{1+cos\frac{x}{2}}{2}$
54	$sin3x = 3sinx - 4sin^3 x$	78	$cos^2 \frac{x}{6} = \dfrac{1+cos\frac{x}{3}}{2}$
55	$sin4x = 4sinxcosx - 8sin^3 xcosx$	79	$cos^2 \frac{x}{8} = \dfrac{1+cos\frac{x}{4}}{2}$
56	$sin5x = 5sinx - 20sin^3 x + 16sin^5 x$	80	$x + y + z = 180^0$ $sin2x + sin2y + sin2z = 4sinxsinysinz$
57	$cos3x = 4cos^3 x - 3cosx$	81	$cosx \cdot cos\frac{x}{2} \cdot cos\frac{x}{2^2} \cdot ... \cdot cos\frac{x}{2^n} = \dfrac{sin2x}{2^{n+1}sin\frac{x}{2^n}}$
58	$cos4x = 8cos^4 x - 8cos^2 x + 1$	82	$sin^2 x + sin^2 2x + ... + sin^2 nx = \frac{n}{2} - \dfrac{sinnxcos(n+1)x}{2sinx}$
59	$cos5x = 16cos^5 x - 20cos^3 x + 5cosx$	83	$sinxsin(60^0 - x)\sin(60^0 + x) = \frac{1}{4}sin3x$
60	$cosx = siny \quad agar \quad x + y = 90^0$	84	$cosxcos(60^0 - x)\cos(60^0 + x) = \frac{1}{4}cos3x$
61	$sinx = siny \quad agar \quad x + y = 180^0$	85	$sinx + sin2x + sin3x + ... + sinnx = \dfrac{sin\frac{nx}{2}sin\frac{n+1}{2}x}{sin\frac{x}{2}}$
62	$sin^2 nx = \dfrac{1-cos2nx}{2}$	86	$cosx + cos2x + cos3x + ... + cosnx = \dfrac{sin\frac{nx}{2}cos\frac{n+1}{2}x}{sin\frac{x}{2}}$
63	$sin^2 x = \dfrac{1-cos2x}{2}$	87	$asinx + bcosx = \sqrt{a^2 + b^2}\sin(x + arctg\frac{b}{a})$
64	$sin^2 2x = \dfrac{1-cos4x}{2}$	88	$asinx + bcosx = \sqrt{a^2 + b^2}\cos(x - arctg\frac{a}{b})$
65	$sin^2 3x = \dfrac{1-cos6x}{2}$	89	$tgx = \dfrac{sinx}{cosx}$
66	$sin^2 4x = \dfrac{1-cos8x}{2}$	90	$ctgx = \dfrac{cosx}{sinx}$
67	$sin^2 \frac{x}{2} = \dfrac{1-cosx}{2}$	91	$tgx \cdot ctgx = 1$
68	$sin^2 \frac{x}{4} = \dfrac{1-cos\frac{x}{2}}{2}$	92	$1 + tg^2 x = \dfrac{1}{cos^2 x}$
69	$sin^2 \frac{x}{6} = \dfrac{1-cos\frac{x}{3}}{2}$	93	$1 + ctg^2 x = \dfrac{1}{sin^2 x}$
70	$sin^2 \frac{x}{8} = \dfrac{1-cos\frac{x}{4}}{2}$		

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94	$tg^2x - tg^2y = \dfrac{\sin(x+y)\sin(x-y)}{\cos^2x\cos^2y}$	117	$cos2x = \dfrac{1 - tg^2x}{1 + tg^2x}$	
95	$ctg^2x - ctg^2y = \dfrac{\sin(x+y)\sin(y-x)}{\sin^2x\sin^2y}$	118	$tg\dfrac{x}{2} = \dfrac{sinx}{1 + cosx} = \dfrac{1 - cosx}{sinx}$	
96	$tg^2x - sin^2x = tg^2x\,sin^2x$	119	$ctg\dfrac{x}{2} = \dfrac{sinx}{1 - cosx} = \dfrac{1 + cosx}{sinx}$	
97	$ctg^2x - cos^2x = ctg^2x\,cos^2x$	120	$tg^2\dfrac{x}{2} = \dfrac{1 - cosx}{1 + cosx}$	
98	$tg(x+y) = \dfrac{tgx + tgy}{1 - tgx\,tgy}$	121	$ctg^2\dfrac{x}{2} = \dfrac{1 + cosx}{1 - cosx}$	
99	$tg(x-y) = \dfrac{tgx - tgy}{1 + tgx\,tgy}$	122	$tgx\,tg(60^0 - x)tg(60^0 + x) = tg3x$	
100	$tgx + tgy = \dfrac{\sin(x+y)}{cosx\,cosy}$	123	$ctgx\,ctg(60^0 - x)ctg(60^0 + x) = ctg3x$	
101	$tgx - tgy = \dfrac{\sin(x-y)}{cosx\,cosy}$	124	$(1 + tgx)(1 + tgy) = 2\ \ agar\ \ x + y = 45^0$	
102	$ctgx + ctgy = \dfrac{\sin(x+y)}{sinx\,siny}$			
103	$ctgx - ctgy = -\dfrac{\sin(x-y)}{sinx\,siny}$			
104	$tgx + ctgy = \dfrac{\cos(x-y)}{cosx\,siny}$			
105	$tgx - ctgy = -\dfrac{\cos(x+y)}{cosx\,siny}$			
106	$ctgx - tgx = 2ctg2x$			
107	$ctgx + tgx = \dfrac{2}{sin2x}$			
108	$tgx \cdot tgy = \dfrac{tgx + tgy}{ctgx + ctgy} = -\dfrac{tgx - tgy}{ctgx - ctgy}$			
109	$ctgx \cdot ctgy = \dfrac{ctgx + ctgy}{tgx + tgy} = -\dfrac{ctgx - ctgy}{tgx - tgy}$			
110	$tgx \cdot ctgy = \dfrac{tgx + tgy}{ctgx + ctgy} = -\dfrac{tgx - ctgy}{ctgx - tgy}$			
111	$tgx = ctgy\ \ agar\ \ x + y = 90^0$			
112	$tg2x = \dfrac{2tgx}{1 - tg^2x}$			
113	$tg3x = \dfrac{3tgx - tg^3x}{1 - 3tg^2x}$			
114	$tg4x = \dfrac{4tgx - 4tg^3x}{1 - 6tg^2x + tg^4x}$			
115	$tg5x = \dfrac{tg^5x - 10tg^3x + 5tgx}{1 - 10tg^2x + 5tg^4x}$			
116	$sin2x = \dfrac{2tgx}{1 + tg^2x}$			