Trigonometric Functions of Some Special Angles (Degrees)

Angle	sin	cos	tan	cot	sec	
$0°$	0	1	0	∞	1	∞
$15°=\ \pi/12$	$\sqrt{2}(\sqrt{3}-1)/4$	$\sqrt{2}(\sqrt{3}+1)/4$	$2-\sqrt{3}$	$2+\sqrt{3}$	$\sqrt{2}(\sqrt{3}-1)$	$\sqrt{2}(\sqrt{3}+1)$
$30°=\ \pi/6$	$1/2$	$\sqrt{3}/2$	$\sqrt{3}/3$	$\sqrt{3}$	$2\sqrt{3}/3$	2
$45°=\ \pi/4$	$\sqrt{2}/2$	$\sqrt{2}/2$	1	1	$\sqrt{2}$	$\sqrt{2}$
$60°=\ \pi/3$	$\sqrt{3}/2$	$1/2$	$\sqrt{3}$	$\sqrt{3}/3$	2	$2\sqrt{3}/3$
$75°=\ 5\pi/12$	$\sqrt{2}(\sqrt{3}+1)/4$	$\sqrt{2}(\sqrt{3}-1)/4$	$2+\sqrt{3}$	$2-\sqrt{3}$	$\sqrt{2}(\sqrt{3}+1)$	$\sqrt{2}(\sqrt{3}-1)$
$90°=\ \pi/2$	1	0	∞	0	∞	1
$105°=\ 7\pi/12$	$\sqrt{2}(\sqrt{3}+1)/4$	$-\sqrt{2}(\sqrt{3}-1)/4$	$-(2+\sqrt{3})$	$-(2-\sqrt{3})$	$-\sqrt{2}(\sqrt{3}+1)$	$\sqrt{2}(\sqrt{3}-1)$
$120°=\ 2\pi/3$	$\sqrt{3}/2$	$-1/2$	$-\sqrt{3}$	$-\sqrt{3}/3$	-2	$2\sqrt{3}/3$
$135°=\ 3\pi/4$	$\sqrt{2}/2$	$-\sqrt{2}/2$	-1	-1	$-\sqrt{2}$	$\sqrt{2}$
$150°=\ 5\pi/6$	$1/2$	$-\sqrt{3}/2$	$-\sqrt{3}/3$	$-\sqrt{3}$	$-2\sqrt{3}/3$	2
$165°=11\pi/12$	$\sqrt{2}(\sqrt{3}-1)/4$	$-\sqrt{2}(\sqrt{3}+1)/4$	$-(2-\sqrt{3})$	$-(2+\sqrt{3})$	$-\sqrt(\sqrt{3}-1)$	$\sqrt{2}(\sqrt{3}+1)$
$180°=\ \pi$	0	-1	0	∞	-1	∞
$195°=13\pi/12$	$-\sqrt{2}(\sqrt{3}-1)/4$	$-\sqrt{2}(\sqrt{3}+1)/4$	$2-\sqrt{3}$	$2+\sqrt{3}$	$-\sqrt{2}(\sqrt{3}-1)$	$\sqrt{2}(\sqrt{3}+1)$
$210°=\ 7\pi/6$	$-1/2$	$-\sqrt{3}/2$	$\sqrt{3}/3$	$\sqrt{3}$	$-2\sqrt{3}/3$	2
$225°=\ 5\pi/4$	$-\sqrt{2}/2$	$-\sqrt{2}/2$	1	1	$-\sqrt{2}$	$\sqrt{2}$
$240°=\ 4\pi/3$	$-\sqrt{3}/2$	$-1/2$	$\sqrt{3}$	$\sqrt{3}/3$	-2	$2\sqrt{3}/3$
$255°=17\pi/12$	$-\sqrt{2}(\sqrt{3}+1)/4$	$-\sqrt{2}(\sqrt{3}-1)/4$	$2+\sqrt{3}$	$2-\sqrt{3}$	$-\sqrt{2}(\sqrt{3}+1)$	$\sqrt{2}(\sqrt{3}-1)$
$270°=\ 3\pi/2$	-1	0	∞	0	∞	1
$285°=19\pi/12$	$-\sqrt{2}(\sqrt{3}+1)/4$	$\sqrt{2}(\sqrt{3}-1)/4$	$-(2+\sqrt{3})$	$-(2-\sqrt{3})$	$\sqrt{2}(\sqrt{3}+1)$	$\sqrt{2}(\sqrt{3}-1)$
$300°=\ 5\pi/3$	$-\sqrt{3}/2$	$1/2$	$-\sqrt{3}$	$-\sqrt{3}/3$	2	$2\sqrt{3}/3$
$315°=\ 7\pi/4$	$-\sqrt{2}/2$	$\sqrt{2}/2$	-1	-1	$\sqrt{2}$	$\sqrt{2}$
$330°=11\pi/6$	$-1/2$	$\sqrt{3}/2$	$-\sqrt{3}/3$	$-\sqrt{3}$	$2\sqrt{3}/3$	2
$345°=23\pi/12$	$-\sqrt{2}(\sqrt{3}-1)/4$	$\sqrt{2}(\sqrt{3}+1)/4$	$-(2-\sqrt{3})$	$-(2+\sqrt{3})$	$\sqrt{2}(\sqrt{3}-1)$	$\sqrt{2}(\sqrt{3}+1)$

Trigonometric Functions of Some Special Angles (Radians)

Angle	sin	cos	tan
$0\ \ =\ 0°$	0	1	0
$\pi/10=\ 18°$	$(\sqrt{5}-1)/4$	$\sqrt{2}\cdot\sqrt{5+\sqrt{5}}/4$	$\sqrt{5}\cdot\sqrt{5-2\sqrt{5}}/5$
$2\pi/10=\ 36°$	$\sqrt{2}\cdot\sqrt{5-\sqrt{5}}/4$	$(\sqrt{5}+1)/4$	$\sqrt{5-2\sqrt{5}}$
$3\pi/10=\ 54°$	$(\sqrt{5}+1)/4$	$\sqrt{2}\cdot\sqrt{5-\sqrt{5}}/4$	$\sqrt{5}\cdot\sqrt{5+2\sqrt{5}}/5$
$4\pi/10=\ 72°$	$\sqrt{2}\cdot\sqrt{5+\sqrt{5}}/4$	$(\sqrt{5}-1)/4$	$\sqrt{5+2\sqrt{5}}$
$5\pi/10=\ 90°$	1	0	∞
$6\pi/10=108°$	$\sqrt{2}\cdot\sqrt{5+\sqrt{5}}/4$	$-(\sqrt{5}-1)/4$	$-\sqrt{5+2\sqrt{5}}$
$7\pi/10=126°$	$(\sqrt{5}+1)/4$	$-\sqrt{2}\cdot\sqrt{5-\sqrt{5}}/4$	$-\sqrt{5}\cdot\sqrt{5+2\sqrt{5}}/5$
$8\pi/10=144°$	$\sqrt{2}\cdot\sqrt{5-\sqrt{5}}/4$	$-(\sqrt{5}+1)/4$	$-\sqrt{5-2\sqrt{5}}$
$9\pi/10=162°$	$(\sqrt{5}-1)/4$	$-\sqrt{2}\cdot\sqrt{5+\sqrt{5}}/4$	$-\sqrt{5}\cdot\sqrt{5-2\sqrt{5}}/5$
$\pi\ \ =180°$	0	-1	0
$11\pi/10=198°$	$-(\sqrt{5}-1)/4$	$-\sqrt{2}\cdot\sqrt{5+\sqrt{5}}/4$	$\sqrt{5}\cdot\sqrt{5-2\sqrt{5}}/5$
$12\pi/10=216°$	$-\sqrt{2}\cdot\sqrt{5-\sqrt{5}}/4$	$-(\sqrt{5}+1)/4$	$\sqrt{5-2\sqrt{5}}$
$13\pi/10=234°$	$-(\sqrt{5}+1)/4$	$-\sqrt{2}\cdot\sqrt{5-\sqrt{5}}/4$	$\sqrt{5}\cdot\sqrt{5+2\sqrt{5}}/5$
$14\pi/10=252°$	$-\sqrt{2}\cdot\sqrt{5+\sqrt{5}}/4$	$-(\sqrt{5}-1)/4$	$\sqrt{5+2\sqrt{5}}$
$15\pi/10=270°$	-1	0	∞
$16\pi/10=288°$	$-\sqrt{2}\cdot\sqrt{5+\sqrt{5}}/4$	$(\sqrt{5}-1)/4$	$-\sqrt{5+2\sqrt{5}}$
$17\pi/10=306°$	$-(\sqrt{5}+1)/4$	$\sqrt{2}\cdot\sqrt{5-\sqrt{5}}/4$	$-\sqrt{5}\cdot\sqrt{5+2\sqrt{5}}/5$
$18\pi/10=324°$	$-\sqrt{2}\cdot\sqrt{5-\sqrt{5}}/4$	$(\sqrt{5}+1)/4$	$-\sqrt{5-2\sqrt{5}}$
$19\pi/10=342°$	$-(\sqrt{5}-1)/4$	$\sqrt{2}\cdot\sqrt{5+\sqrt{5}}/4$	$-\sqrt{5}\cdot\sqrt{5-2\sqrt{5}}/5$
$2\pi\ \ =360°$	0	1	0

Trigonometric Functions of Some Very Special Angles

Angle	sin	cos
$0° = 0$	0	1
$3° = \pi/60$	$(\sqrt{2}\,(\sqrt{3}+1)\,(\sqrt{5}-1) - 2\,(\sqrt{3}-1)\,\sqrt{5+\sqrt{5}})/16$	$(\sqrt{2}\,(\sqrt{3}-1)\,(\sqrt{5}-1) + 2\,(\sqrt{3}+1)\,\sqrt{5+\sqrt{5}})/16$
$6° = \pi/30$	$(-\,(\sqrt{5}+1) + \sqrt{6}\sqrt{5-\sqrt{5}})/8$	$(\sqrt{3}\,(\sqrt{5}+1) + \sqrt{2}\sqrt{5-\sqrt{5}})/8$
$9° = \pi/20$	$(\sqrt{2}\,(\sqrt{5}+1) - 2\sqrt{5-\sqrt{5}})/8$	$(\sqrt{2}\,(\sqrt{5}+1) + 2\sqrt{5-\sqrt{5}})/8$
$12° = \pi/15$	$(-\sqrt{3}(\sqrt{5}-1) + \sqrt{2}\sqrt{5+\sqrt{5}})/8$	$((\sqrt{5}-1) + \sqrt{6}\sqrt{5+\sqrt{5}})/8$
$15° = \pi/12$	$\sqrt{2}(\sqrt{3}-1)/4$	$\sqrt{2}(\sqrt{3}+1)/4$
$18° = \pi/10$	$(\sqrt{5}-1)/4$	$\sqrt{2}\cdot\sqrt{5+\sqrt{5}}/4$
$21° = 7\pi/60$	$(-\sqrt{2}(\sqrt{3}-1)(\sqrt{5}+1) + 2(\sqrt{3}+1)\sqrt{5-\sqrt{5}})/16$	$(\sqrt{2}(\sqrt{3}+1)(\sqrt{5}+1) + 2(\sqrt{3}-1)\sqrt{5-\sqrt{5}})/16$
$24° = 2\pi/15$	$(\sqrt{3}(\sqrt{5}+1) - \sqrt{2}\sqrt{5-\sqrt{5}})/8$	$((\sqrt{5}+1) + \sqrt{6}\sqrt{5-\sqrt{5}})/8$
$27° = 3\pi/20$	$(-\sqrt{2}(\sqrt{5}-1) + 2\sqrt{5+\sqrt{5}})/8$	$(\sqrt{2}(\sqrt{5}-1) + 2\sqrt{5+\sqrt{5}})/8$
$30° = \pi/6$	$1/2$	$\sqrt{3}/2$
$33° = 11\pi/60$	$(\sqrt{2}(\sqrt{3}+1)(\sqrt{5}-1) + 2(\sqrt{3}-1)\sqrt{5+\sqrt{5}})/16$	$(-\sqrt{2}(\sqrt{3}-1)(\sqrt{5}-1) + 2(\sqrt{3}+1)\sqrt{5+\sqrt{5}})/16$
$36° = 2\pi/10$	$\sqrt{2}\cdot\sqrt{5-\sqrt{5}}/4$	$(\sqrt{5}+1)/4$
$39° = 13\pi/60$	$(\sqrt{2}(\sqrt{3}+1)(\sqrt{5}+1) - 2(\sqrt{3}-1)\sqrt{5-\sqrt{5}}))/16$	$(\sqrt{2}(\sqrt{3}-1)(\sqrt{5}+1) + 2(\sqrt{3}+1)\sqrt{5-\sqrt{5}}))/16$
$42° = 7\pi/30$	$(-(\sqrt{5}-1) + \sqrt{6}\sqrt{5+\sqrt{5}})/8$	$(\sqrt{3}(\sqrt{5}-1) + \sqrt{2}\sqrt{5+\sqrt{5}})/8$
$45° = \pi/4$	$\sqrt{2}/2$	$\sqrt{2}/2$
$48° = 5\pi/15$	$(\sqrt{3}(\sqrt{5}-1) + \sqrt{2}\sqrt{5+\sqrt{5}})/8$	$(-(\sqrt{5}-1) + \sqrt{6}\sqrt{5+\sqrt{5}})/8$
$51° = 17\pi/60$	$(\sqrt{2}(\sqrt{3}-1)(\sqrt{5}+1) + 2(\sqrt{3}+1)\sqrt{5-\sqrt{5}}))/16$	$(\sqrt{2}(\sqrt{3}+1)(\sqrt{5}+1) - 2(\sqrt{3}-1)\sqrt{5-\sqrt{5}}))/16$
$54° = 3\pi/10$	$(\sqrt{5}+1)/4$	$\sqrt{2}\cdot\sqrt{5-\sqrt{5}}/4$
$57° = 19\pi/60$	$(-\sqrt{2}(\sqrt{3}-1)(\sqrt{5}-1) + 2(\sqrt{3}+1)\sqrt{5+\sqrt{5}})/16$	$(\sqrt{2}(\sqrt{3}+1)(\sqrt{5}-1) + 2(\sqrt{3}-1)\sqrt{5+\sqrt{5}})/16$
$60° = \pi/3$	$\sqrt{3}/2$	$1/2$
$63° = 7\pi/20$	$(\sqrt{2}(\sqrt{5}-1) + 2\sqrt{5+\sqrt{5}})/8$	$(-\sqrt{2}(\sqrt{5}-1) + 2\sqrt{5+\sqrt{5}})/8$
$66° = 11\pi/30$	$((\sqrt{5}+1) + \sqrt{6}\sqrt{5-\sqrt{5}})/8$	$(\sqrt{3}(\sqrt{5}+1) - \sqrt{2}\sqrt{5-\sqrt{5}})/8$
$69° = 23\pi/60$	$(\sqrt{2}(\sqrt{3}+1)(\sqrt{5}+1) + 2(\sqrt{3}-1)\sqrt{5-\sqrt{5}})/16$	$(-\sqrt{2}(\sqrt{3}-1)(\sqrt{5}+1) + 2(\sqrt{3}+1)\sqrt{5-\sqrt{5}})/16$
$72° = 4\pi/10$	$\sqrt{2}\cdot\sqrt{5+\sqrt{5}}/4$	$(\sqrt{5}-1)/4$
$75° = 5\pi/12$	$\sqrt{2}(\sqrt{3}+1)/4$	$\sqrt{2}(\sqrt{3}-1)/4$
$78° = 13\pi/30$	$((\sqrt{5}-1) + \sqrt{6}\sqrt{5+\sqrt{5}})/8$	$(-\sqrt{3}(\sqrt{5}-1) + \sqrt{2}\sqrt{5+\sqrt{5}})/8$
$81° = 9\pi/20$	$(\sqrt{2}\,(\sqrt{5}+1) + 2\sqrt{5-\sqrt{5}})/8$	$(\sqrt{2}\,(\sqrt{5}+1) - 2\sqrt{5-\sqrt{5}})/8$
$84° = 7\pi/15$	$(\sqrt{3}\,(\sqrt{5}+1) + \sqrt{2}\sqrt{5-\sqrt{5}})/8$	$(-\,(\sqrt{5}+1) + \sqrt{6}\sqrt{5-\sqrt{5}})/8$
$87° = 29\pi/60$	$(\sqrt{2}\,(\sqrt{3}-1)\,(\sqrt{5}-1) + 2\,(\sqrt{3}+1)\,\sqrt{5+\sqrt{5}})/16$	$(\sqrt{2}\,(\sqrt{3}+1)\,(\sqrt{5}-1) - 2\,(\sqrt{3}-1)\,\sqrt{5+\sqrt{5}})/16$
$90° = \pi/2$	1	0