$\tan(15°) = \tan(45 - 30)$

$\tan(\theta - \alpha) = \frac{\tan\theta - \alpha}{1 + \tan\theta\,\alpha}$

$1 - \frac{\sqrt{3}}{3}$

$1 + 1\frac{\sqrt{3}}{3} =$

$\frac{3}{3} - \frac{\sqrt{3}}{3} = \frac{3\sqrt{3}}{3}$

$\frac{3}{3} + \frac{\sqrt{3}}{3}$

$\frac{6\sqrt{3}}{3} \quad \frac{3(\sqrt{3})}{3(1+\sqrt{3})}$

$= \frac{6\sqrt{3}}{12\sqrt{3}} = \frac{1}{2}\sqrt{3}$

$\tan(45) - \tan(30)$

$1 + \tan(45)\cdot\tan(30)$

$\frac{1 - \frac{\sqrt{3}}{3}}{1 + 1\left(\frac{\sqrt{3}}{3}\right)}$

$\tan(195) = \tan(\frac{195}{2})$

$\left(1 - \frac{\sqrt{3}}{3}\right) \times 3$

$\left(1 + \frac{\sqrt{3}}{3}\right) \times 3 = \frac{3 - \sqrt{3}}{3 + \sqrt{3}}$

$\frac{1 - \frac{\sqrt{3}}{3}}{1 + \frac{\sqrt{3}}{3}} = \frac{1 - \sqrt{3}}{1 + \sqrt{3}}$

$\left(\frac{1 + \sqrt{3}}{3}\right)\left(\frac{3 - \sqrt{3}}{3}\right)$

$\frac{\frac{3}{3} - \frac{\sqrt{3}}{3}}{\frac{3}{3} + \frac{\sqrt{3}}{3}}$

$60 - 45$

$\frac{\sqrt{3} - 1}{1 + \sqrt{3}(1)}$

$\frac{\sqrt{3} - 1}{\sqrt{3} + 1}$ ✓

96

$\frac{17\pi}{12} = 120 + 135$

$60 + 45 = \frac{\pi}{3} + \frac{\pi}{4}$

$\tan(60) + \tan(45)$

$\frac{\sqrt{3} + 1}{1 - \sqrt{3}(1)} = \frac{\sqrt{3} + 1}{\sqrt{3} - 1}$ ✓

$\sin\left(\frac{7\pi}{12}\right) = \frac{3\pi}{12} + \frac{4\pi}{12}$ 97

$\frac{\pi}{4} + \frac{\pi}{3}$ $\quad 135 + 240 = 375°$

$\sin(a+b)$

$\sin a\cos b + \sin b\cos a$

$\frac{\sqrt{2}}{2}\cdot\frac{1}{2} + \frac{\sqrt{2}}{2}\cdot\frac{\sqrt{3}}{2}$

$\frac{\sqrt{2}}{4} + \frac{\sqrt{6}}{4}$ ✓

$\cos\left(\frac{5\pi}{12}\right) = \frac{2\pi}{12} + \frac{4\pi}{12}$ 98

$375 = 5°$

$\cos(a+b) =$

$\cos(a)\cos b + \sin a\sin b$

$\frac{\sqrt{2}}{2}\cdot\frac{1}{2} + \frac{\sqrt{2}}{2}\cdot\frac{\sqrt{3}}{2}$

$\frac{\sqrt{2} + \sqrt{6}}{4} = \frac{\sqrt{2} + \sqrt{6}}{4}$

$\tan\left(\frac{19\pi}{12}\right)$ 99

$\frac{19\pi}{12} - \frac{3\pi}{12}$

$\frac{\sqrt{2} - \sqrt{6}}{4}$

$\frac{\sqrt{2} - \sqrt{6}}{4}$

$\frac{\sqrt{2} - \sqrt{6}}{24}$

$\frac{16\pi}{12}$ $\quad \tan\left(\frac{19\pi}{12}\right)$

$\frac{19\pi}{12} = \frac{16\pi}{12} + \frac{3\pi}{12}$

$= \frac{4\pi}{12} + \frac{3\pi}{12}$

$\tan(a+b) =$

$\tan(\theta + \alpha) =$

$\frac{\tan\theta + \tan\alpha}{\tan\theta\tan\theta + 1}$

$\frac{\frac{\sqrt{3}}{3} + 1}{1 + \frac{\sqrt{3}}{3}}$

$\frac{\frac{\sqrt{3}}{3} + 1}{(1)\left(\frac{\sqrt{3}}{3}\right) + 1}$

$\frac{\sqrt{3}}{3} + 1$

$\frac{\sqrt{3}}{3} + 1$

$\frac{3\sqrt{3}}{3}$

$\frac{3\sqrt{3}}{3}$

$\frac{3 + 3\sqrt{3}}{3 + 3\sqrt{3}}$

$\frac{1 + 3\sqrt{3}}{1 + 3\sqrt{3}}$

$\tan\frac{4\pi}{12} + \tan\frac{5\pi}{12}$

$\tan\frac{4\pi}{12}\tan\frac{5\pi}{12} + 1$

$= \frac{1 + \frac{\sqrt{3}}{3}}{1 + \left(\frac{\sqrt{3}}{3}\right)}$

$\frac{3 + \sqrt{3}}{3 \times 3} \quad \frac{3\sqrt{3}}{9} = \frac{\sqrt{3}}{3}$

$\frac{1 + \sqrt{3}}{1} = \frac{2 + \sqrt{3}}{2}$

$\frac{225}{12} - \frac{\pi}{4}$

$225 = 300 - 25$

$= 225 + 60 = \frac{\pi}{4} + \frac{\pi}{3}$

$= \frac{\pi}{6} + \frac{\pi}{4}$

$= \frac{\sqrt{3} + 1}{(\sqrt{3})(1) + 1}$

$\frac{\sqrt{3} + 1}{\sqrt{3} - 1}$ ✓

$\cos\left(\frac{\pi}{12}\right) = \frac{4\pi}{6}$ 100

$= \frac{\pi}{6} + \frac{\pi}{3} + 60 - 45$

$\cos(a - b) = \frac{\pi}{6} - \frac{\pi}{4}$

$= \cos a\cos b - \sin a\sin b$

$= \frac{1}{2}\cdot\frac{\sqrt{2}}{2} - \frac{\sqrt{3}}{2}\cdot\frac{\sqrt{2}}{2}$

$= \frac{\sqrt{2} - \sqrt{6}}{4}$

$= 0.9659258262$

$\cos\left(\frac{\pi}{12}\right) = 55.764°$

$\frac{\pi}{6} \times \frac{2}{2} = \frac{2\pi}{12}$

$\frac{3\pi}{12} - \frac{2\pi}{12} = \frac{\pi}{12}$

$\cos(a - b)$

$\cos a\cos b + \sin a\sin b$

$= \frac{\sqrt{2}}{2}\cdot\frac{1}{2} + \frac{\sqrt{2}}{2}\cdot\frac{\sqrt{3}}{2}$

$\frac{\sqrt{2} + \sqrt{6}}{4}$ ✓

$\sin\left(\frac{7\pi}{12}\right)$ 102

$\frac{4\pi}{12} + \frac{3\pi}{12}$

$\sin(a + b) =$

$\sin a\cos b + \sin b\cos a$

$= \frac{1}{2}\cdot\frac{\sqrt{2}}{2} + \frac{\sqrt{2}}{2}\cdot\frac{\sqrt{3}}{2}$

$= \frac{\sqrt{2} + \sqrt{6}}{4}$

$\frac{\sqrt{3} + 1}{\sqrt{3} - 1} = \frac{\sqrt{3} + 1}{\sqrt{3} - 1}$ ✓

$\left(\frac{17\pi}{12}\right) 202$

$= 120 + 135 = \frac{2\pi}{12} + \frac{3\pi}{12}$

$\cos(a + b) =$

$\cos a\cos b - \sin a\sin b$

$= \frac{1}{2}\cdot\frac{\sqrt{2}}{2} - \frac{\sqrt{3}}{2}\cdot\frac{\sqrt{2}}{2}$

$= \frac{\sqrt{2} - \sqrt{2}}{4}$ ✓

103

$h(t) = -0.6\cos\left(\frac{2\pi}{2.5}t\right) + 1.5$

$12 = -0.6\cos\left(\frac{2\pi}{2.5}t\right) + 1.5$

$-0.3 = -0.6\cos\left(\frac{2\pi}{2.5}t\right)$

$\frac{-0.3}{-0.6} = \cos\left(\frac{2\pi}{2.5}t\right)$

$\cos^{-1}(0.5) = 1.0471$

$\pi - \alpha = 2.0944$

$t = \frac{2.5}{2\pi} = 0,4166$

$2\pi - \alpha = 5,2358$

$\theta = \frac{2.5}{2\pi} = 2.0833$

$\sin(\alpha) = -0.7$ 104

$\sin^{-1}(0.7) = 0.775397$

$\pi - \alpha = \frac{180}{\pi} = 44,42$

$2\pi - \alpha = \frac{180}{\pi} = 315,58$

$\beta = 135.57296$

$44.42 + N.360$

$135.57 + N.360$

$9\sin(18x) + 11 = 2$ 105

$\sin(18x) = \frac{2 - 11}{9}$

$\sin(18x) = -\frac{9}{9} = 1$

$\sin^{-1}(1) = \frac{\pi}{2}$

$\pi - \frac{\pi}{2} = \frac{\pi}{2}$

$2\pi - \frac{\pi}{2} = \frac{3\pi}{2} \to -\frac{3\pi}{2}$

$\alpha = 90 \quad \cancel{\alpha = -90}$

$\beta = 270 \quad -\beta$

$x = \frac{\alpha}{18} + N.\frac{2\pi}{18}$

$x = \frac{\pi}{2} + N.\frac{\pi}{9}$

$x = \frac{\pi}{18} + N.\frac{\pi}{9}$

$x = \frac{\pi.1}{2.18} + N.\frac{\pi}{9}$

$x = \frac{\pi}{36} + N.\frac{\pi}{9}$

$x = -\frac{3\pi}{2} + N.\frac{\pi}{9}$

$x = \frac{-3\pi}{36} + N.\frac{\pi}{9}$

$x = -\frac{\pi}{12} + N.\frac{\pi}{9}$ ✓

$\cos(345°)$ 106

$\cos(300) + \cos(45)$

$\frac{2\pi}{12} + \frac{3\pi}{12}$

$\cos(a + b) = \cos a\cos b + \sin a\sin b$

$= \frac{\sqrt{2}}{2}\cdot\frac{\sqrt{2}}{2} + \frac{\sqrt{2}}{2}\cdot\frac{\sqrt{3}}{2}$

$\frac{\sqrt{6} + \sqrt{2}}{4}$ ✓

$\sin(\alpha) = 0$ 107

$\sin^{-1}(0) = 0$

$\{5103, 1050\}$

$\sin(x) = 1$

$\sin(x) = 1$

$\pi - 0 = \pi = 180$

$= 180 + N.360$ ✓

$\sin\left(\frac{61\pi}{12}\right) = \frac{25}{12} + \frac{3\pi}{12}$ 108

$\sin(a + b) = \sin a\cos b + \sin b\cos a$

$= \frac{\sqrt{2}}{2}\cdot\frac{\sqrt{3}}{2} + \frac{\sqrt{2}}{2}\cdot\frac{1}{2}$

$= \frac{\sqrt{6} + \sqrt{2}}{4}$ ✓

109

$6\sin(8x) + 2 = -3$

$\sin(8x) = \frac{-3 - 2}{6}$

$\sin(8x) = \frac{-5}{6} \to \sin^{-1}\left(\frac{-5}{6}\right)$

$\alpha = -0.9651107837$

$\pi + (\alpha) = -2.15648187$

$\alpha = -123,5573110$

$\beta = -56,4421890$

$\alpha + N.360$

$\beta + N.360$

$x = \frac{\alpha + N.360}{8}$

$x = -7.055 + N.45$

$x = \frac{\beta + N.360}{8}$ ✓

$x = -5,446 + N.45$

$w(t) = 15\cos\left(\frac{2\pi}{365}t\right) + 43$ 110

MAX $\forall t$

$30 = 15\cos\left(\frac{2\pi}{365}t\right) + 43$

$\frac{-13}{15} = \cos\left(\frac{2\pi}{365}t\right) = \cos^{-1}\left(\frac{-13}{15}\right)$

$= \alpha = 2,619277233$

$\pi - \alpha = 0,522314822 = \beta$

$2\pi - \alpha = 3,663707487 = \theta$

$t = \frac{\alpha}{2\pi} = 152,157$ ✓

$\sin(x) = 1$ 111

$\sin^{-1}(1) = \frac{\pi}{2}$

$\pi - \beta_\alpha = \frac{\pi}{2}$

$\frac{\pi}{2} + N.360$ ✓