

Download this PDF to your computer and go to

www.livescribe.com/player

On iOS, open the PDF in Livescribe+.

$$\sin(\alpha) \cos(\beta)$$

$$\begin{aligned} \sin(\alpha + \beta) &= \sin(\alpha) \cos(\beta) + \cos(\alpha) \sin(\beta) \\ + \sin(\alpha - \beta) &= \sin(\alpha) \cos(\beta) - \cos(\alpha) \sin(\beta) \\ \hline \sin(\alpha + \beta) + \sin(\alpha - \beta) &= 2 \sin(\alpha) \cos(\beta) \end{aligned}$$

$$\sin(\alpha) \cos(\beta) = \frac{\sin(\alpha + \beta) + \sin(\alpha - \beta)}{2}$$

$$\cos(\alpha) \sin(\beta)$$

$$\sin(\alpha + \beta) - \sin(\alpha - \beta) = 2 \cos(\alpha) \sin(\beta)$$

$$\cos(\alpha) \sin(\beta) = \frac{\sin(\alpha + \beta) - \sin(\alpha - \beta)}{2}$$

$$\cos(\alpha) \cos(\beta)$$

$$\begin{aligned} \cos(\alpha + \beta) &= \cos(\alpha) \cos(\beta) - \sin(\alpha) \sin(\beta) \\ + \cos(\alpha - \beta) &= \cos(\alpha) \cos(\beta) + \sin(\alpha) \sin(\beta) \end{aligned}$$

$$\cos(\alpha + \beta) + \cos(\alpha - \beta) = 2 \cos(\alpha) \cos(\beta)$$

$$\cos(\alpha) \cos(\beta) = \frac{\cos(\alpha + \beta) + \cos(\alpha - \beta)}{2}$$

$$\sin(\alpha) \sin(\beta)$$

$$\cos(\alpha + \beta) - \cos(\alpha - \beta) = -2 \sin(\alpha) \sin(\beta)$$

$$\sin(\alpha) \sin(\beta) = \frac{\cos(\alpha - \beta) - \cos(\alpha + \beta)}{2}$$

$$\frac{u+v}{2} + \frac{u-v}{2} = \frac{2u}{2} = u$$

$$\frac{u+v}{2} - \frac{u-v}{2} = \frac{2v}{2} = v$$

04.04.2020 12:53p

4/4/20, 9:57 AM, 26m 18s

$$\sin(\alpha) \cos(\beta)$$

$$\begin{aligned} \sin(\alpha + \beta) &= \sin(\alpha) \cos(\beta) + \cos(\alpha) \sin(\beta) \\ + \sin(\alpha - \beta) &= \sin(\alpha) \cos(\beta) - \cos(\alpha) \sin(\beta) \\ \hline \sin(\alpha + \beta) + \sin(\alpha - \beta) &= 2 \sin(\alpha) \cos(\beta) \end{aligned}$$

$$\sin(\alpha) \cos(\beta) = \frac{\sin(\alpha + \beta) + \sin(\alpha - \beta)}{2}$$

$$\cos(\alpha) \sin(\beta)$$

$$\sin(\alpha + \beta) - \sin(\alpha - \beta) = 2 \cos(\alpha) \sin(\beta)$$

$$\cos(\alpha) \sin(\beta) = \frac{\sin(\alpha + \beta) - \sin(\alpha - \beta)}{2}$$

$$\cos(\alpha) \cos(\beta)$$

$$\begin{aligned} \cos(\alpha + \beta) &= \cos(\alpha) \cos(\beta) - \sin(\alpha) \sin(\beta) \\ + \cos(\alpha - \beta) &= \cos(\alpha) \cos(\beta) + \sin(\alpha) \sin(\beta) \end{aligned}$$

$$\cos(\alpha + \beta) + \cos(\alpha - \beta) = 2 \cos(\alpha) \cos(\beta)$$

$$\cos(\alpha) \cos(\beta) = \frac{\cos(\alpha + \beta) + \cos(\alpha - \beta)}{2}$$

$$\sin(\alpha) \sin(\beta)$$

$$\cos(\alpha + \beta) - \cos(\alpha - \beta) = -2 \sin(\alpha) \sin(\beta)$$

$$\sin(\alpha) \sin(\beta) = \frac{\cos(\alpha - \beta) - \cos(\alpha + \beta)}{2}$$

$$\frac{u+v}{2} + \frac{u-v}{2} = \frac{2u}{2} = u$$

$$\frac{u+v}{2} - \frac{u-v}{2} = \frac{2v}{2} = v$$

$$\begin{aligned} \sin(\alpha) + \sin(\beta) &= 2 \sin\left(\frac{\alpha+\beta}{2}\right) \cos\left(\frac{\alpha-\beta}{2}\right) \quad \leftarrow \\ \sin(\alpha) - \sin(\beta) &= 2 \cos\left(\frac{\alpha+\beta}{2}\right) \sin\left(\frac{\alpha-\beta}{2}\right) \quad \leftarrow \\ \cos(\alpha) + \cos(\beta) &= 2 \cos\left(\frac{\alpha+\beta}{2}\right) \cos\left(\frac{\alpha-\beta}{2}\right) \quad \leftarrow \\ \cos(\alpha) - \cos(\beta) &= -2 \sin\left(\frac{\alpha+\beta}{2}\right) \sin\left(\frac{\alpha-\beta}{2}\right) \quad \leftarrow \end{aligned}$$

$$\begin{aligned} \sin(195^\circ) \cos(75^\circ) &= \frac{\sin(195^\circ + 75^\circ) + \sin(195^\circ - 75^\circ)}{2} \\ &= \frac{\sin(270^\circ) + \sin(120^\circ)}{2} = \frac{-1 + \frac{\sqrt{3}}{2}}{2} = \frac{-2 + \sqrt{3}}{4} \end{aligned}$$

$$\begin{aligned} \sin(75^\circ) + \sin(15^\circ) &= 2 \sin\left(\frac{75^\circ + 15^\circ}{2}\right) \sin\left(\frac{75^\circ - 15^\circ}{2}\right) \\ &= 2 \sin(45^\circ) \sin(30^\circ) = 2 \left(\frac{\sqrt{2}}{2}\right) \left(\frac{1}{2}\right) = \frac{\sqrt{2}}{2} \end{aligned}$$

$$\begin{aligned} \cos(3\theta) \cos(4\theta) &= \frac{\cos(3\theta - 4\theta) + \cos(3\theta + 4\theta)}{2} = \frac{\cos(-\theta) + \cos(7\theta)}{2} \\ &= \frac{\cos(\theta) + \cos(7\theta)}{2} \end{aligned}$$

$$\begin{aligned} \cos(5\theta) - \cos(3\theta) &= -2 \sin\left(\frac{5\theta + 3\theta}{2}\right) \sin\left(\frac{5\theta - 3\theta}{2}\right) \\ &= -2 \sin(4\theta) \sin(\theta) \end{aligned}$$

$$\cos(22.5^\circ) = \sqrt{\frac{1 + \cos(45^\circ)}{2}} = \sqrt{\frac{1 + \frac{\sqrt{2}}{2}}{2}} = \sqrt{\frac{2 + \sqrt{2}}{4}} = \frac{\sqrt{2 + \sqrt{2}}}{2}$$

$$\rightarrow \sec\left(\frac{15\pi}{8}\right) = \frac{2}{\sqrt{2 + \sqrt{2}}}$$

$$\begin{aligned} \cos\left(\frac{15\pi}{8}\right) &= \sqrt{\frac{1 + \cos\left(\frac{15\pi}{4}\right)}{2}} = \sqrt{\frac{1 + \frac{\sqrt{2}}{2}}{2}} = \sqrt{\frac{2 + \sqrt{2}}{4}} \\ &= \frac{\sqrt{2 + \sqrt{2}}}{2} \end{aligned}$$



$$\begin{aligned} \sin(\theta) &= -\frac{3}{5}, \quad \theta \in \left(\pi, \frac{3\pi}{2}\right) \\ \cos(2\theta) &= 1 - 2\sin^2(\theta) = 1 - 2\left(-\frac{3}{5}\right)^2 = 1 - 2\left(\frac{9}{25}\right) = 1 - \frac{18}{25} \\ &= \frac{7}{25} \end{aligned}$$