

Section 6.2 →
Sum, Difference and Double
Angle Identities.

RECALL:

$$\begin{cases} \sin 30^\circ = \frac{1}{2} \\ \cos 30^\circ = \frac{\sqrt{3}}{2} \\ \tan 30^\circ = \frac{1}{\sqrt{3}} \end{cases} \begin{cases} \sin 60^\circ = \frac{\sqrt{3}}{2} \\ \cos 60^\circ = \frac{1}{2} \\ \tan 60^\circ = \sqrt{3} \end{cases} \begin{cases} \sin 45^\circ = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2} \\ \cos 45^\circ = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2} \\ \tan 45^\circ = 1 \end{cases}$$

* $30^\circ = \frac{\pi}{6}$ $60^\circ = \frac{\pi}{3}$ $45^\circ = \frac{\pi}{4}$

QUADRANTS

Feb 18-10:04 AM

Exact Value of:

- $\sin 135^\circ = \frac{\sqrt{2}}{2}$
- ~~cos~~ $\frac{5\pi}{6} = -\frac{\sqrt{3}}{2}$
- $\sin 45^\circ + \cos 45^\circ$

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

$$= \frac{2\sqrt{2}}{2} = \sqrt{2}$$

~~3/3~~
 $\frac{3}{\sqrt{3}} \left(\frac{\sqrt{3}}{\sqrt{3}} \right) = \frac{3\sqrt{3}}{3}$

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$$\left(\frac{a}{\sqrt{a}} \right) \left(\frac{\sqrt{a}}{\sqrt{a}} \right) \rightarrow \sqrt{a}$$

$$= \frac{a\sqrt{a}}{a}$$

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④ $\sin 75^\circ \neq \sin 30^\circ + \sin 45^\circ$

$$= \sin(30^\circ + 45^\circ)$$

$$= \sin 30^\circ \cos 45^\circ + \sin 45^\circ \cos 30^\circ$$

$$= \left(\frac{1}{2} \right) \left(\frac{\sqrt{2}}{2} \right) + \left(\frac{\sqrt{2}}{2} \right) \left(\frac{\sqrt{3}}{2} \right)$$

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

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

Bad MISTAKE if you write $\frac{\sqrt{8}}{4}$

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⑤ $\cos 105^\circ$

$$= \cos(60^\circ + 45^\circ)$$

$$= \cos 60^\circ \cos 45^\circ - \sin 60^\circ \sin 45^\circ$$

$$= \left(\frac{1}{2} \right) \left(\frac{\sqrt{2}}{2} \right) - \left(\frac{\sqrt{3}}{2} \right) \left(\frac{\sqrt{2}}{2} \right)$$

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

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⑥ $\cos^2\left(\frac{\pi}{3}\right) - \sin^2\left(\frac{\pi}{3}\right)$ * $\cos^2 A - \sin^2 A = \cos 2A$

$$= \cos\left(2\left(\frac{\pi}{3}\right)\right)$$

$$= \cos \frac{2\pi}{3}$$

$$= -\frac{1}{2}$$

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$$\begin{aligned} \textcircled{7} \text{ Simplify (no Calc)} \\ \sin 21^\circ \cos 32^\circ + \sin 32^\circ \cos 21^\circ \\ \left(\begin{aligned} & * \sin(A+B) \\ & = \sin(21+32) \\ & = \sin 53^\circ \end{aligned} \right. \end{aligned}$$

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$$\begin{aligned} \textcircled{8} \quad \overset{A}{\cos 22^\circ} \overset{B}{\cos 18^\circ} - \overset{A}{\sin 22^\circ} \overset{B}{\sin 18^\circ} \\ * \cos(A+B) \\ \rightarrow = \cos(22+18) \\ = \cos 40^\circ \\ \textcircled{9} \quad \frac{2 \tan \frac{\pi}{8}}{1 - \tan^2 \frac{\pi}{8}} = 1 \end{aligned}$$

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$$\begin{aligned} \textcircled{10} \quad \cos \frac{\pi}{12} \\ = \cos \left(\frac{\pi}{4} - \frac{\pi}{6} \right) \\ = \cos \frac{\pi}{4} \cdot \cos \frac{\pi}{6} + \sin \frac{\pi}{4} \cdot \sin \frac{\pi}{6} \\ = \left(\frac{\sqrt{2}}{2} \right) \left(\frac{\sqrt{3}}{2} \right) + \left(\frac{\sqrt{2}}{2} \right) \left(\frac{1}{2} \right) \\ = \frac{\sqrt{6} + \sqrt{2}}{4} \quad \square \end{aligned}$$

Feb 18-10:43 AM

$$\begin{aligned} \text{Pg } 306 - 307 \\ \# 1, 4, 5, 8 \end{aligned}$$

Feb 18-10:52 AM