Section 5.3 : Sum and Difference identities.

26. $\cos(x+y) = \cos x \cos y - \sin x \sin y$

27. $\cos(x-y) = \cos x \cos y + \sin x \sin y$

28. $\sin(x+y) = \sin x \cos y + \sin y \cos x$

29. $\sin(x-y) = \sin x \cos y - \sin y \cos x$

Ex1 $\cos(30^\circ + 60^\circ) = \cos 30^\circ \cos 60^\circ - \sin 30^\circ \sin 60^\circ$

(I 26) ↓

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

$= \frac{\sqrt{3}}{4} - \frac{\sqrt{3}}{4} = 0$

$\cos 90^\circ = 0$ ✓

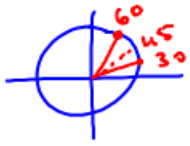
Ex2 $\cos(75^\circ) = \cos(30^\circ + 45^\circ)$

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

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

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

$= \frac{\sqrt{3} \cdot \sqrt{2}}{4} - \frac{\sqrt{2}}{4} = \frac{\sqrt{2}(\sqrt{3} - 1)}{4}$



Ex 3 $\sin 20 \cos 70 + \sin 70 \cos 20$

$= \sin(20° + 70°) = \sin(90°) = 1$

Ex 4: Prove $\cos\left(x + \frac{\pi}{2}\right) = -\sin x$.

(I 26) $\cos x \cdot \cos\frac{\pi}{2} - \sin x \sin\frac{\pi}{2}$

$\cos\frac{\pi}{2} = 0$

$= -\sin x \cdot \sin\frac{\pi}{2}$

$\sin\frac{\pi}{2} = 1$

$= -\sin x$

Hw p 425 11–14

426 17–19

23–25–26*–27–28