

# Introduction to Sum and Difference Identities

## Part A – Recognizing Hidden Forms

1. Identify the sum or difference identity  $\sin(a \pm b)$ ,  $\cos(a \pm b)$ , and  $\tan(a \pm b)$  that matches each expression.

a)  $\cos 70^\circ \cos 20^\circ + \sin 70^\circ \sin 20^\circ$

d)  $\cos \frac{\pi}{3} \cos \frac{\pi}{4} + \sin \frac{\pi}{3} \sin \frac{\pi}{4}$

b)  $\sin 20^\circ \cos 10^\circ + \cos 20^\circ \sin 10^\circ$

e)  $\sin 42^\circ \cos 17^\circ - \cos 42^\circ \sin 17^\circ$

c)  $\cos 110^\circ \cos 10^\circ - \sin 110^\circ \sin 10^\circ$

f)  $\frac{\tan(\pi/9) + \tan(5\pi/36)}{1 - \tan(\pi/9)\tan(5\pi/36)}$

## Part B – Exact Values (Easy)

2. Evaluate exactly.

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

d)  $\cos(45^\circ - 30^\circ)$

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

e)  $\tan(45^\circ + 30^\circ)$

c)  $\sin(60^\circ - 30^\circ)$

## Part C – Exact Values (Medium)

3. Rewrite each angle as a sum or difference of special angles, then evaluate exactly.

a)  $\cos 75^\circ$

d)  $\tan 15^\circ$

b)  $\sin 15^\circ$

e)  $\cos 75^\circ$

c)  $\sin 105^\circ$

## Part D – Exact Values (Hard)

4. Rewrite each angle as a sum or difference of special angles, then evaluate exactly.

a)  $\cos 195^\circ$

d)  $\tan 15^\circ$

f)  $\sin\left(\frac{5\pi}{12}\right)$

b)  $\sin 375^\circ$

e)  $\cos\left(\frac{5\pi}{12}\right)$

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

c)  $\cos 255^\circ$