

57a

$\sin \alpha = \frac{3}{5}$ , Q I  
 $\sin \beta = \frac{5}{13}$ , Q II

Find  $\cos(\alpha + \beta)$

$$\frac{-63}{65}$$

59b

$\tan \alpha = -\frac{3}{4}$ , Q II  
 $\cos \beta = \frac{1}{3}$ , Q I

Find:  $\sin(\alpha + \beta) = \frac{3 - 8\sqrt{2}}{15}$

61c

$\cos \alpha = \frac{8}{17}$   
 $\sin \beta = -\frac{1}{2}$

Find  $\tan(\alpha + \beta) = \frac{-45 + 8\sqrt{3}}{24 + 15\sqrt{3}}$

63

$\tan \alpha = \frac{3}{4}$   
 $\cos \beta = \frac{1}{2}$

Find  $\cos(\alpha + \beta) = \frac{-4 - 3\sqrt{5}}{20}$

$\sin(\alpha + \beta) = \frac{-3 + 4\sqrt{5}}{20}$   
 $\tan(\alpha + \beta) = \frac{3 - 4\sqrt{5}}{4 + 3\sqrt{5}}$

Hint: Do NOT use 4 quadrants!

72

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

$$\frac{\cos \alpha \cos \beta + \sin \alpha \sin \beta + \cos \alpha \cos \beta - \sin \alpha \sin \beta}{-\sin \alpha \cos \beta + \sin \alpha \cos \beta + \sin \beta \cos \alpha + \sin \beta \cos \alpha}$$

$$\frac{2 \cos \alpha \cos \beta}{2 \sin \beta \cos \alpha}$$

$$\frac{\cos \beta}{\sin \beta}$$

$$\boxed{\cot \beta}$$

73

$$\cos\left(\frac{\pi}{6} + \alpha\right) \cos\left(\frac{\pi}{6} - \alpha\right) - \sin\left(\frac{\pi}{6} + \alpha\right) \sin\left(\frac{\pi}{6} - \alpha\right)$$

$$\cos\left(\frac{\pi}{6} + \alpha + \frac{\pi}{6} - \alpha\right)$$

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

$$\boxed{\frac{1}{2}}$$