

Sum and Difference Formulas

Complete the equations

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

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

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

$$\sin(\alpha + \beta) =$$

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

$$\sin(\alpha - \beta) =$$

$$\tan(\alpha + \beta) =$$

$$\tan(\alpha + (-\beta)) =$$

Find the exact value

•  $\sin\left(\frac{5\pi}{12}\right)$

•  $\tan\left(\frac{7\pi}{12}\right)$

•  $\cos(165^\circ)$

•  $\sin(105^\circ)$

•  $\sec\left(-\frac{\pi}{12}\right)$

•  $\cot\left(-\frac{5\pi}{12}\right)$

•  $\sin 20^\circ \cos 80^\circ - \cos 20^\circ \sin 80^\circ$

•  $\cos 40^\circ \cos 10^\circ + \sin 40^\circ \sin 10^\circ$

•  $\frac{\tan 20^\circ + \tan 25^\circ}{1 - \tan 20^\circ \tan 25^\circ}$

•  $\cos\left(\frac{5\pi}{12}\right)\cos\left(\frac{7\pi}{12}\right) - \sin\left(\frac{5\pi}{12}\right)\sin\left(\frac{7\pi}{12}\right)$

•  $\sin\left(\frac{\pi}{12}\right)\cos\left(\frac{7\pi}{12}\right) - \cos\left(\frac{\pi}{12}\right)\sin\left(\frac{7\pi}{12}\right)$

•  $\sin\left(\frac{\pi}{18}\right)\cos\left(\frac{5\pi}{18}\right) + \cos\left(\frac{\pi}{18}\right)\sin\left(\frac{5\pi}{18}\right)$

Find exact value under each condition

a.  $\sin(a+b)$       b.  $\cos(a+b)$       c.  $\sin(a-b)$       d.  $\cos(a-b)$

•  $\cos a = \frac{\sqrt{5}}{5}, 0 < a < \frac{\pi}{2}; \sin b = -\frac{4}{5}, -\frac{\pi}{2} < b < 0$

•  $\tan a = \frac{5}{12}, \pi < a < \frac{3\pi}{2}; \sin b = -\frac{1}{2}, \pi < b < \frac{3\pi}{2}$