Handout for MATH 1300 (Barsamian) Lect. L38 Thu Nov 12, 2026 Section 5.2 Sum Formulas

[1] Draw the first quadrant of the unit circle, with the angles $\frac{\pi}{6}, \frac{\pi}{4}, \frac{\pi}{3}$ labeled. Put (x, y) coordinates (exact values) at the points where the rays of those angles cross the unit circle. Use that data to write the following (exact values).

$\sin\frac{\pi}{6} =$

$\cos\frac{\pi}{6} =$

$\tan\frac{\pi}{6} =$

$\sin\frac{\pi}{4} =$

$\cos\frac{\pi}{4} =$

$\tan\frac{\pi}{4} =$

$\sin\frac{\pi}{3} =$

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

$\tan\frac{\pi}{3} =$

[2] Write the angles $\frac{\pi}{12}, \frac{5\pi}{12}, \frac{7\pi}{12}, \frac{11\pi}{12}$ as sums or differences of the angles $\frac{\pi}{6}, \frac{\pi}{4}, \frac{\pi}{3}$.

$\frac{\pi}{12} =$

$\frac{5\pi}{12} =$

$\frac{7\pi}{12} =$

$\frac{11\pi}{12} =$

[3] Use the even & odd properties of the trig functions to rewrite these expressions with (x) inside

$\sin(-x) =$

$\cos(-x) =$

$\tan(-x) =$

[4] The angle sum formulas for sin, cos, tan are below. Use the even & odd properties to write the angle difference formulas.

$\sin(a+b) = \sin a \cos b + \cos a \sin b$

$\cos(a+b) = \cos a \cos b - \sin a \sin b$

$\tan(a+b) = \dfrac{\tan a + \tan b}{1 - \tan a \tan b}$

$\sin(a-b) =$

$\cos(a-b) =$

$\tan(a-b) =$

[5] Use the sum formulas to find the exact value of $\cos\frac{7\pi}{12}$

[6] Use the sum formulas to find the exact value of $\tan\frac{\pi}{12}$

[7] Use the sum formulas and even & odd properties to find the exact value of $\sin\left(-\frac{5\pi}{12}\right)$