

## HW 4.5.1.a: Sum and Difference Formulas

Use the sum and difference formulas to find an exact value for each of the following.

1.  $\sin(75^\circ)$       2.  $\sin(195^\circ)$       3.  $\cos(165^\circ)$       4.  $\cos(345^\circ)$

5.  $\cos\left(\frac{7\pi}{12}\right)$       6.  $\cos\left(\frac{\pi}{12}\right)$       7.  $\sin\left(\frac{5\pi}{12}\right)$       8.  $\sin\left(\frac{11\pi}{12}\right)$

Rewrite in terms of  $\sin(x)$  and  $\cos(x)$ .

9.  $\sin\left(x + \frac{11\pi}{6}\right)$       10.  $\sin\left(x - \frac{3\pi}{4}\right)$       11.  $\cos\left(x - \frac{5\pi}{6}\right)$       12.  $\cos\left(x + \frac{2\pi}{3}\right)$

Solve each equation for all solutions.

13.  $\sin(3x)\cos(6x) - \cos(3x)\sin(6x) = \frac{\sqrt{2}}{2}$       14.  $\sin(11x)\cos(6x) - \cos(11x)\sin(6x) = \frac{\sqrt{3}}{2}$



15.  $\cos(2x)\cos(x) + \sin(2x)\sin(x) = 1$

16.  $\cos(5x)\cos(3x) - \sin(5x)\sin(3x) = \frac{\sqrt{3}}{2}$

17. How could you evaluate  $\tan\left(\frac{13\pi}{12}\right)$  if you did not know the sum and difference formula for tangent?

18. Prove the sine and cosine cofunction identities using the sum and difference formulas.