Class Discussion: Other Important Identities

Sum and Difference Identities	Half Angle Identities
$\sin(A+B)=\sin(A)\cos(B)+\cos(A)\sin(B)$ $\sin(A-B)=\sin(A)\cos(B)-\cos(A)\sin(B)$ $\cos(A+B)=\cos(A)\cos(B)-\sin(A)\sin(B)$ $\cos(A-B)=\cos(A)\cos(B)+\sin(A)\sin(B)$	$\sin\left(\frac{A}{2}\right)=\pm\sqrt{\frac{1-\cos(A)}{2}}$ $\cos\left(\frac{A}{2}\right)=\pm\sqrt{\frac{1+\cos(A)}{2}}$

EXAMPLE: Use a sum-and-difference identity to find the value of $\cos\left(\frac{7\pi}{12}\right)$.

EXAMPLE: Use a half-angle identity and the fact that $\frac{7\pi}{12}=\frac{7\pi/6}{2}$ to find the value of $\cos\left(\frac{7\pi}{12}\right)$.

Double Angle Identities	**Half Angle Identities**
$\sin(2A) = 2\sin(A)\cos(A)$ $\cos(2A) = 1 - 2\sin^2(A)$ $\cos(2A) = 2\cos^2(A) - 1$ $\cos(2A) = \cos^2(A) - \sin^2(A)$	$\sin\left(\frac{A}{2}\right) = \pm\sqrt{\frac{1-\cos(A)}{2}}$ $\cos\left(\frac{A}{2}\right) = \pm\sqrt{\frac{1+\cos(A)}{2}}$

EXAMPLE: Suppose that $\cos(\theta) = \frac{5}{13}$ and $\frac{3\pi}{2} < \theta < 2\pi$. Find the following.

a. $\sin(\theta)$

b. $\sin(2\theta)$

c. $\cos\left(\frac{\theta}{2}\right)$