Name_____

Precalculus Unit 8 – 8.2 Homework
Solving Trigonometric Equations using Identities

1. Solve: $\cos\left(x+\frac{\pi}{4}\right)-\cos\left(x-\frac{\pi}{4}\right)=1$

2. Solve: $\sin(2x)+\cos x=0$

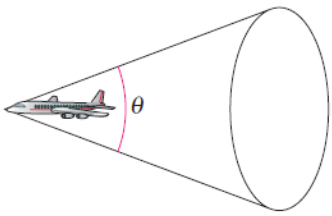
3. Use the double angle formulas to find the value of $\sin 2u$, $\cos 2u$, and $\tan 2u$ given $\tan u=\frac{1}{2}$ and $\pi<u<\frac{3\pi}{2}$.

4. Solve: $\cos(2x) + 6\,sin^2\,(x) = 4$

5. Solve: $\cos(2x) - \cos(6x) = 0$

6. Solve: $\sin(2x) + 1 = 0$

7. The mach number *M* of an airplane is the ratio of its speed to the speed of sound. When an airplane travels faster than the speed of sound, the sound waves form a cone behind the airplane (see figure). The mach number is related to the apex angle θ of the cone by $\sin\frac{\theta}{2} = \frac{1}{M}$.



a. Find the angle θ that corresponds to a mach number of 1.

b. Find the angle θ that corresponds to a mach number of 4.5.

c. The speed of sound is about 760 miles per hour. Determine the speed of an object having a mach number of 1 and the speed of an object with a mach number of 4.5.