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# PLANE TRIGONOMETRY
# EXAM II
# July 02, 2007

There are 10 questions and each worth 10 points. Solve the problems in the space provided. **Show all your work for full points**. Sign and submit your formula sheet with the exam.

1. Find the solutions of the equation $\cos(2x-\frac{\pi}{4})=0$ that are in the interval $[0,2\pi]$.
2. Use the addition and subtraction formulas to show,
   (a) $\sin 15^\circ = \frac{\sqrt{3}-1}{2\sqrt{2}}$
   (b) $\cos\left(\frac{7\pi}{12}\right) = \frac{\sqrt{2}-\sqrt{6}}{4}$
3. Use the half angle formulas to show that,
   (a) $\sin 22.5^\circ = \sqrt{\frac{\sqrt{2}-1}{2}}$
   (b) $\cos\left(\frac{5\pi}{8}\right) = \sqrt{\frac{\sqrt{2}-1}{2}}$
4. Find the exact values of the given expressions.
   (a) $\sin\left(\arcsin\left(\frac{\sqrt{3}}{2}\right)+\arccos(0)\right)$
   (b) $\cos\left(2\arccos\left(\frac{-\sqrt{3}}{2}\right)\right)$
5. Verify the following identity $\frac{\cos t+\cos 4t+\cos 7t}{\sin t+\sin 4t+\sin 7t}=\cot 4t$ .
6. Find the solutions of the equation $\csc^5\theta-4\csc\theta=0$ in the interval $[-\pi,\pi]$.
7. If $\theta$ and $\phi$ are acute angles such that $\csc\theta=\frac{5}{3}, \cos\phi=\frac{8}{17}$. Show that,

(a) $\sin(\vartheta + \phi) = \dfrac{77}{85}$

(b) $\cos(2\theta + 2\phi) =$