1. (4pts) Find the exact value of $\sin 15°$. Do not use the calculator.

2. (7pts) Suppose $\sin \theta = \dfrac{2}{3}$ and $\dfrac{\pi}{2} < \theta < \pi$. Find the exact values (do not use the calculator) of:

     a) $\cos 2\theta$ b) $\sin \dfrac{\theta}{2}$.

Solve the following equations:

3. (4pts) $2\cos\theta - \sqrt{3} = 0$

4. (6pts) $\tan 2\theta = 1, \quad 0 \le \theta < 2\pi$

5. (7pts) $2\cos^2\theta + 3\cos\theta - 2 = 0$

6. (7pts) $\cos(2\theta) + 6\sin^2\theta = 4$

7. (5pts) Use your calculator to solve $\sin\theta = 0.67$, $0 \le \theta < 2\pi$ with accuracy to two decimal places. A picture will help you.

8. (5pts) Use the graphing feature of your calculator to solve the equation $x^2 + x = \cos x$ with accuracy to two decimal places. Draw the graph here and indicate the solutions.

9. (5pts) Use known trigonometric identities (including the double-angle formulas) to establish the identity $\sin 4\theta = 4\sin\theta\cos\theta(1 - 2\sin^2\theta)$.

Bonus (5pts) Find $\sin\left[2\arccos\left(-\dfrac{4}{7}\right)\right]$.