Free Response Practice #45 Calculator NOT Permitted

Let $f(\theta) = \sin 2\theta$ and $g(\theta) = \cot \theta (1 - \cos 2\theta)$. Use the function to answer the following questions.

a. For what exact value(s) of θ is $f(\theta) = \sin \theta$ on the interval $\frac{\pi}{2} < \theta \le \pi$. Show your work.

b. For what exact value(s) of θ is $2f(\theta) = -\sqrt{3}$ on the interval $0 < \theta \le 2\pi$. Show your work.

c. Using trigonometric identities, analytically show that $f(\theta) = g(\theta)$ for all values of θ .

Free Response Practice #46 Calculator Permitted

Consider the functions $f(\theta) = \cos 2\theta$ and $g(\theta) = (\cos \theta + \sin \theta)(\cos \theta - \sin \theta)$.

a. Find the exact value(s) on the interval $0 < \theta \le 2\pi$ for which $2f(\theta) + 1 = 0$. Show your work.

b. Find the exact value(s) on the interval $\frac{\pi}{2} < \theta < \pi$ for which $f(\theta) = \sin \theta$. Show your work.

c. To three decimal places, find the values of $f\left(\frac{\pi}{8}\right)$ and $g\left(\frac{\pi}{8}\right)$.

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d. Would your results from part c) hold true for all values of θ . Justify your answer.	

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