MA 154 Name_____

Using Sum and Difference Identities

1. Use the sum and difference identities to show the following facts, some old, some new.

Example: $\sin(-\theta) = -\sin\theta$
Answer: $\sin(-\theta) = \sin(0-\theta) = \sin 0\cos\theta - \cos 0\sin\theta = 0\cdot\cos\theta - 1\cdot\sin\theta = -\sin\theta$

a. $\cos(-\theta) = \cos\theta$

b. $\sin(\frac{\pi}{2}-\theta) = \cos\theta$

c. $\cos(\frac{\pi}{2}-\theta) = \sin\theta$

d. $\tan(\pi+\theta) = \tan\theta$

e. $\sin 2\theta = 2\sin\theta\cos\theta$
Hint: $\sin 2\theta = \sin(\theta+\theta)$

f. $\cos 2\theta = \cos^2\theta - \sin^2\theta$

g. $\tan 2\theta = \frac{2\tan\theta}{1-\tan^2\theta}$

h. $\sin(\theta+\pi) = -\sin\theta$

i. $\cos(\theta-\pi) = -\cos\theta$

j. $\sin(\frac{\pi}{4}+\theta) + \cos(\frac{\pi}{4}+\theta) = \sqrt{2}\cos\theta$