TUTORING

[trig identities]

1. Prove the following identities:
   a. $\sin\theta\tan\theta + \sec\theta = \frac{\sin^2\theta+1}{\cos\theta}$
   b. $\sin^2\theta\cot^2\theta = 1 - \sin^2\theta$
   c. $\csc^2\theta - 1 = \csc^2\theta\cos^2\theta$
   d. $\sin^2\theta = \frac{\tan^2\theta}{1+\tan^2\theta}$
   e. $\frac{\sin\theta+\cos\theta\cot\theta}{\cot\theta} = \sec\theta$
   f. $1 - \sin\beta\cos\beta\tan\beta = \cos^2\beta$
   g. $\frac{\sin\theta+\tan\theta}{1+\cos} = \tan\theta$
   h. $(1-\cos\theta)(1+\cos\theta) = \frac{1}{\csc^2\theta}$
   i. $\cos^3\theta + \cos\theta\sin^2\theta = \frac{1}{\sec\theta}$
   j. $\frac{\cos\theta}{1+\sin\theta} + \frac{\cos\theta}{1-\sin\theta} = 2\sec\theta$
   k. $\tan\theta + \cot\theta = \sec\theta\csc\theta$
   l. $\cos^4\theta - \sin^4\theta + 2\sin^2\theta = 1$
   m. $\cos^2\theta = (1-\sin\theta)(1+\sin\theta)$
   n. $\frac{\sin^2\theta}{1-\cos} = 1 + \cos\theta$
   o. $\frac{1-\tan^2\beta}{\tan\beta-\tan^2\beta} = 1 + \frac{1}{\tan\beta}$
   p. $1 - \cos^2\theta = \frac{\cos\theta\sin\theta}{\cot\theta}$
   q. $\sin^4 x - \cos^4 x = \sin^2 x - \cos^2 x$
   r. $\frac{1}{1+\tan^2 x} + \frac{1}{1+\cot^2 x} = 1$
   s. $\frac{\sec\theta}{\csc^2\theta} = \sec\theta - \cos\theta$
2. Solve the following for the angle, on the interval $[0°, 360°]$
   a. $2\cos\alpha = 1$
   b. $5\sin\theta = 4$
   c. $2\cos^2\beta = 1$
   d. $\sin^2 x + \sin x = 0$
   e. $2\cos^2\theta - \cos\theta = 0$
   f. $\sin 2\alpha = 0.75$
   g. $4\cos 2\theta - 3 = 0$
   h. $2\cos^2\beta + \cos\beta - 1 = 0$
   i. $3\tan\theta - 2 = 0$
   j. $5\tan 2x + 2 = 0$
   k. $2\sin x = \cos x$
   l. $\csc\theta = 1$