Warm Up

Prove the following identity:

$$\frac{\boxed{\sin^2 2\theta}}{\cos\theta} \bullet \boxed{\csc^2\theta} = \frac{4}{\boxed{\sec\theta}}$$

$$\frac{(2\sin\theta\cos\theta)^2}{\cos\theta} \cdot \frac{1}{\sin^2\theta} \qquad \frac{4}{\frac{1}{\cos\theta}}$$

$$\frac{4\cancel{\sin^2\theta}\cos^{\cancel{2}}\theta}{\cancel{\cos\theta}} \cdot \frac{1}{\cancel{\sin^2\theta}} \qquad 4 \cdot \frac{\cos\theta}{1}$$

$$\boxed{4\cos\theta} \qquad \boxed{4\cos\theta}$$

Questions from Homework

③ $\boxed{\sin(x+y)}\boxed{\sin(x-y)} = \cos^2 y - \cos^2 x$

$(\sin x\cos y + \cos x\sin y)(\sin x\cos y - \cos x\sin y)$

$\boxed{\sin^2 x}\cos^2 y - \cos^2 x\boxed{\sin^2 y}$

$(1-\cos^2 x)(\cos^2 y) - \cos^2 x(1-\cos^2 y)$

$\cos^2 y - \cancel{\cos^2 x\cos^2 y} - \cos^2 x + \cancel{\cos^2 x\cos^2 y}$

$\boxed{\cos^2 y - \cos^2 x}$

$\boxed{\cos^2 y - \cos^2 x}$

④ $\boxed{\sin(x-y)} + \boxed{\cos(x+y)} = (\cos x+\sin x)(\cos y-\sin y)$

$\sin x\cos y - \cos x\sin y + \cos x\cos y - \sin x\sin y$

$\boxed{(\sin x+\cos x)(\cos y-\sin y)}$

$(\sin x\cos y - \sin x\sin y) + (\cos x\cos y - \cos x\sin y)$

$\sin x(\cos y-\sin y) + \cos x(\cos y - \sin y)$

$\boxed{(\sin x+\cos x)(\cos y-\sin y)}$

⑥ $\cos\theta(1-\boxed{\cos 2\theta})$

$\cos\theta(1-(\cos^2\theta-\sin^2\theta))$

$\cos\theta(\boxed{1-\cos^2\theta}+\sin^2\theta)$

$\cos\theta(\sin^2\theta+\sin^2\theta)$

$\cos\theta(2\sin^2\theta)$

$\boxed{2\sin^2\theta\cos\theta}$

$\sin\theta\boxed{\sin 2\theta}$

$(\sin\theta)(2\sin\theta\cos\theta)$

$\boxed{2\sin^2\theta\cos\theta}$