Questions from homework

D.O.S.

(18) $\dfrac{\sin^4\theta - \cos^4\theta}{\sin^2\theta\cos^2\theta - \cos^4\theta} = \dfrac{\csc^2\theta}{\cot^2\theta}$

C.F. →

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

$\dfrac{1}{\cos^2\theta}$

$\dfrac{\frac{1}{\sin^2\theta}}{\frac{\cos^2\theta}{\sin^2\theta}}$

$\dfrac{1}{\sin^2\theta} \cdot \dfrac{\sin^2\theta}{\cos^2\theta}$

$\dfrac{1}{\cos^2\theta}$

(1) $\dfrac{\tan^2\theta}{\tan^2\theta + 1} = \sin^2\theta$

$\dfrac{\frac{\sin^2\theta}{\cos^2\theta}}{\sec^2\theta}$

$\dfrac{\frac{\sin^2\theta}{\cos^2\theta}}{\frac{1}{\cos^2\theta}}$

$\dfrac{\sin^2\theta}{\cos^2\theta} \cdot \cos^2\theta$

$\sin^2\theta$

Sum & Difference Identities

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

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

$$\sin(\overset{x}{30^\circ} + \overset{y}{60^\circ}) = \sin 30^\circ \cos 60^\circ + \cos 30^\circ \sin 60^\circ$$

$$\sin(90^\circ) = \left(\frac{1}{2}\right)\left(\frac{1}{2}\right) + \left(\frac{\sqrt{3}}{2}\right)\left(\frac{\sqrt{3}}{2}\right)$$

$$1 = \frac{1}{4} + \frac{3}{4}$$

$$1 = 1$$

Sum & Difference Identities

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

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

Prove the following:

$$\cos(\alpha+\beta)-\cos(\alpha-\beta)=-2\sin\alpha\sin\beta$$

$\cos(x+y)-\cos(x-y)=-2\sin x\sin y$

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

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

$-2\sin x\sin y$

$-2\sin x\sin y$

Double Angle Identities

$$\sin 2\theta = 2\sin\theta\cos\theta$$

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

Prove the following:

$$\frac{1+\cos 2\theta}{\sin 2\theta} = \cot\theta$$

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

Pythagorean

$$\frac{1-\sin^2\theta+\cos^2\theta}{2\sin\theta\cos\theta}$$

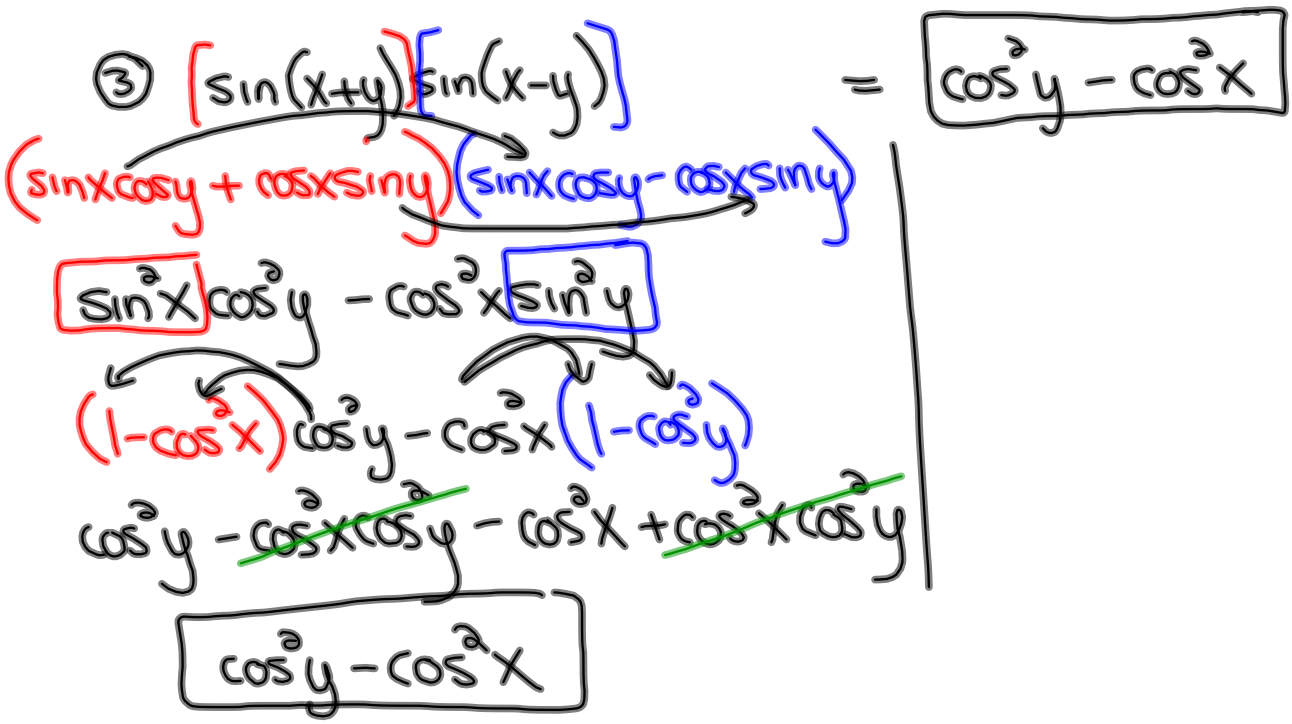
$$\frac{\cos^2\theta+\cos^2\theta}{2\sin\theta\cos\theta}$$

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

$$\frac{\cos\theta}{\sin\theta}$$

$$\frac{\cos\theta}{\sin\theta}$$

Homework


③ sin(x+y)sin(x-y) = cos²y - cos²x
(sinxcosy + cosxsiny)(sinxcosy - cosxsiny)
sin²xcos²y - cos²xsin²y
(1-cos²x)cos²y - cos²x(1-cos²y)
cos²y - cos²xcos²y - cos²x + cos²xcos²y
cos²y - cos²x