Questions from homework

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

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

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

$\dfrac{\sin^2\theta}{\cancel{\cos^2\theta}} \times \cancel{\cos^2\theta}$

$\sin^2\theta$

⑤ $\sec^2\theta - \sin^2\theta = \boxed{\cos^2\theta} + \boxed{\tan^2\theta}$

$1-\sin^2\theta + \sec^2\theta - 1$

$\sec^2\theta - \sin^2\theta$

⑬ $\dfrac{1+\cos\theta}{\boxed{\sin^2\theta}} = \dfrac{1}{1-\cos\theta}$

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

$\dfrac{\cancel{(1+\cos\theta)}}{\cancel{(1+\cos\theta)}(1-\cos\theta)}$

$\dfrac{1}{1-\cos\theta}$

Questions from homework

(18)

$$\frac{\sin^4\theta - \cos^4\theta}{\sin^2\theta\cos^2\theta - \cos^4\theta} = \frac{\boxed{\csc^2\theta}}{\boxed{\cot^2\theta}}$$

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

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

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

$$\frac{1}{\cancel{\sin^2\theta}} \times \frac{\cancel{\sin^2\theta}}{\cos^2\theta}$$

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

Sum & Difference Identities

The sum identities are

$$\sin(A + B) = \sin A \cos B + \cos A \sin B$$
$$\cos(A + B) = \cos A \cos B - \sin A \sin B$$
$$\tan(A + B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}$$

The three angle difference identities are

$$\sin(A - B) = \sin A \cos B - \cos A \sin B$$
$$\cos(A - B) = \cos A \cos B + \sin A \sin B$$
$$\tan(A - B) = \frac{\tan A - \tan B}{1 + \tan A \tan B}$$

Prove the following:

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

$\boxed{\cos(A+B)} - \boxed{\cos(A-B)} = -2\sin A\sin B$

$\cos A\cos B - \sin A\sin B - (\cos A\cos B + \sin A\sin B)$ | $-2\sin A\sin B$

$\cancel{\cos A\cos B} - \sin A\sin B - \cancel{\cos A\cos B} - \sin A\sin B$

$-2\sin A\sin B$

Double Angle Identities

The double-angle identities are

$$\sin 2A = 2 \sin A \cos A$$

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

$$\tan 2A = \frac{2 \tan A}{1 - \tan^2 A}$$

Prove the following:

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

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

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

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

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

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

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

Homework

The sum identities are

$$\sin(A + B) = \sin A \cos B + \cos A \sin B$$
$$\cos(A + B) = \cos A \cos B - \sin A \sin B$$
$$\tan(A + B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}$$

The three angle difference identities are

$$\sin(A - B) = \sin A \cos B - \cos A \sin B$$
$$\cos(A - B) = \cos A \cos B + \sin A \sin B$$
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$$\sin 2A = 2 \sin A \cos A$$
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