6.1: Trig. Identities

Definition: Two functions f and g are said to be identically equal , if $f(x)=g(x)$ for every value of x for which both sides of the equation are defined (called an Identity)

(*) An equation that is not an identity is called conditional equation.

EX: Establish each identity

1) $\frac{1-\sin\theta}{\cos\theta}+\frac{\cos\theta}{1-\sin\theta}=2\sec\theta$

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

3) $\frac{1}{1-\sin\theta}+\frac{1}{1+\sin\theta}=2\sec^2\theta$

4) $\sin\theta\csc\theta-\cos^2\theta=\sin^2\theta$

5) $1+\cot^2(-\theta)=\csc^2\theta$

6) $1-\frac{\sin^2(-\theta)}{1+\cos(-\theta)}=\cos\theta$

7) $\sec\theta-\tan\theta=\frac{\cos\theta}{1+\sin\theta}$

8) $\frac{\sec\theta}{1-\sec\theta}=\frac{1}{\cos\theta-1}$

9) $\frac{\sin\theta\cos\theta}{\cos^2\theta-\sin^2\theta}=\frac{\tan\theta}{1-\tan^2\theta}$

10) $\frac{\sec\theta-\csc\theta}{\sec\theta\csc\theta}=\sin\theta-\cos\theta$

11) $\frac{\sec\theta}{\csc\theta}+\frac{\sin\theta}{\cos\theta}=2\tan\theta$

12) $\frac{\sec\theta-\cos\theta}{\tan\theta}=\sin\theta$

Ex: True or False

1) $\frac{\sec^2\theta-1}{\sec^2\theta}=\sin^2\theta$, 2) $\frac{\sin\theta}{\csc\theta-\sin\theta}=\tan^2\theta$, 3) $(\sin\theta+\cos\theta)^2=\sin^2\theta+\cos^2\theta$

4) $\sqrt{\sin^2\theta+\cos^2\theta}=\sin\theta+\cos\theta$, 5) $\frac{1-(\sin\theta-\cos\theta)^2}{2\cos\theta}=\sin\theta$, 6) $\frac{\cot\theta}{\cos\theta}=\sin\theta$