5.2 Proving Trigonometric Identities

1. $\tan x \dfrac{1}{\cot x} = \tan^2 x$

2. $(1-\cos x)(1+\cos x) = \sin^2 x$

3. $\cos^2 x \csc x \sec x = \cot x$

4. $(1-\cos^2 \theta)\cot\theta = \sin\theta\cos\theta$

5. $\dfrac{\sin x}{\cos x} + \dfrac{\cos x}{\sin x} = \dfrac{\csc x}{\cos x}$

6. $\tan\theta\csc\theta\cos\theta = 1$

7. $(\sin x - \cos x)^2 = 1 - 2\sin x\cos x$

8. $\dfrac{\csc x}{\cos x} - \dfrac{\cos x}{\sin x} = \tan x$

9. $\csc x - \sin x = \cot x\cos x$

10. $\cot x(\tan x\sin x + \cos x) = \csc x$

11. $(1+\sin x)(1-\sin x) = \cos^2 x$

12. $\csc x - \sin x = \cos x\cot x$

13. $\dfrac{\sin x}{\csc x} + \dfrac{\cos x}{\sec x} = 1$

14. $\dfrac{1+\sin x}{\cos x} = \dfrac{\cos x}{1-\sin x}$

15. $\dfrac{\csc^2 x}{\cot^2 x} = 1 + \tan^2 x$

16. $\dfrac{\sec^2 x - 1}{\sin^2 x} = \sec^2 x$

17. $\tan^2 x - \sin^2 x = \sin^2 x\tan^2 x$

18. $\dfrac{1-\sin^2 x}{\csc x - \sin x} = \sin x$

19. $\dfrac{\sec x - \cos x}{\cos x} = \tan^2 x$

20. $\dfrac{\sin t}{1-\cos t} + \dfrac{1+\cos t}{\sin t} = \dfrac{2(1+\cos t)}{\sin t}$