Math 1613 - Trigonometry

Discussion Board Week 5 - Due 2019.07.07

Verify the given identities.

1. $\dfrac{1-\cos^2(t)}{\sin^3(t)} = \csc(t)$
2. $\dfrac{(\cos(\alpha)-1)^2}{\sin^2(\alpha)} = \dfrac{1-\cos(\alpha)}{1+\cos(\alpha)}$
3. $\dfrac{1-\tan^2(x)}{1-\tan^4(x)} = \cos^2(x)$
4. $\cot^2(z)\cos^2(z) = \cot^2(z) - \cos^2(z)$
5. $\dfrac{\sin(2y)}{\cot(y)} = 1-\cos(2y)$
6. $\dfrac{\cot(w/2)}{1+\cos(w)} = \csc(w)$
7. $\csc(2x) = \dfrac{\tan(x)+\cot(x)}{2}$
8. $\dfrac{\sin(x-y)}{\sin(x+y)} = \dfrac{\tan(x)-\tan(y)}{\tan(x)+\tan(y)}$
9. $\dfrac{2-\sec^2(u)}{\sec^3(u)} = \cos(2u)$
10. $\dfrac{\sin(t)+\sin(5t)}{\cos(t)+\cos(5t)} = \tan(3t)$
11. $\dfrac{\sin(x)+\sin(y)}{\cos(x)-\cos(y)} = -\cot\left(\dfrac{x-y}{2}\right)$
12. $\dfrac{\cot(z)}{\csc(z)+1} = \dfrac{\csc(z)-1}{\cot(z)}$
13. $\dfrac{2\tan^2(a)-1}{\tan^3(a)-3\tan(a)} = \cot(3a)$
14. $\dfrac{\sin(2t)+\sin(4t)}{\cos(2t)-\cos(4t)} = \cot(t)$
15. $\cos(x)-\cos(y) = -2\sin\left(\dfrac{x+y}{2}\right)\sin\left(\dfrac{x-y}{2}\right)$