Additional Verifying Practice

1) $\dfrac{1-3\cos x-4\cos^2 x}{\sin^2 x} = \dfrac{1-4\cos x}{1-\cos x}$

$-\dfrac{(4\cos^2 x+3\cos x-1)}{1-\cos^2 x}$

$-\dfrac{(4\cos x-1)\cancel{(\cos x+1)}}{(1-\cos x)\cancel{(1+\cos x)}}$

$\dfrac{1-4\cos x}{1-\cos x}$

2) $\dfrac{\sec^2 x-6\tan x+7}{\sec^2 x-5} = \dfrac{\tan x-4}{\tan x+2}$

$\dfrac{\tan^2 x-6\tan x+8}{\tan^2 x-4}$

$\dfrac{(\tan x-4)\cancel{(\tan x-2)}}{\cancel{(\tan x-2)}(\tan x+2)}$

$\dfrac{\tan x-4}{\tan x+2}$

3) $\dfrac{\sin^3 A+\cos^3 A}{\sin A+\cos A} = 1-\sin A\cos A$

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

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

$1-\sin A\cos A$

4) $\dfrac{\sec^3 \beta-\cos^3 \beta}{\sec \beta-\cos \beta} = \sec^2 \beta+1+\cos^2 \beta$

$\dfrac{\cancel{(\sec \beta-\cos \beta)}(\sec^2 \beta+\sec \beta\cos \beta+\cos^2 \beta)}{\cancel{\sec \beta-\cos \beta}}$

$\sec^2 \beta+1+\cos^2 \beta$

5) $(2\sin x + 3\cos x)^2 + (3\sin x - 2\cos x)^2 = 13$

$4\sin^2 x + 12\sin x\cos x + 9\cos^2 x + 9\sin^2 x - 12\sin x\cos x + 4\cos^2 x = 13$

$4(\sin^2 x + \cos^2 x) + 9(\cos^2 x + \sin^2 x)$

$4 + 9$

13

6) $\cos^2\beta - \sin^2\beta = 2\cos^2\beta - 1$

$\cos^2\beta - (1 - \cos^2\beta)$

$\cos^2\beta - 1 + \cos^2\beta$

$2\cos^2\beta - 1$

7) $\tan^2\theta + 4 = \sec^2\theta + 3$

$= \tan^2\theta + 1 + 3$

$= \tan^2\theta + 4$

8) $\dfrac{\sec^2 x}{\tan x} = \sec x \csc x$

$\cot x \sec^2 x$

$\dfrac{\cancel{\cos x}}{\sin x} \cdot \dfrac{1}{\cos^{\cancel{2}} x}$

$\dfrac{1}{\sin x \cos x}$

$\sec x \csc x$

9) $\dfrac{\sec x + \tan x}{\sec x - \tan x} = (\sec x + \tan x)^2$

$\dfrac{(\sec x + \tan x)(\sec x + \tan x)}{\sec^2 x - \tan^2 x}$

$\dfrac{\sec^2 x + 2\sec x\tan x + \tan^2 x}{1}$

$(\sec x + \tan x)^2$

10) $\dfrac{1}{\cot x + 1} + \dfrac{1}{\tan x + 1} = 1$

$\dfrac{\tan x + 1 + \cot x + 1}{(\cot x + 1)(\tan x + 1)}$

$\dfrac{\tan x + \cot x + 2}{1 + \cot x + \tan x + 1}$

$\dfrac{\tan x + \cot x + 2}{\tan x + \cot x + 2}$

1

11) $\sec^4\theta - \tan^4\theta = 1 + 2\tan^2\theta$

$\underbrace{(\sec^2\theta - \tan^2\theta)}_{1}(\sec^2\theta + \tan^2\theta)$

$\tan^2\theta + 1 + \tan^2\theta$

$2\tan^2\theta + 1$

12) $\dfrac{\sin\beta}{1 - \cos\beta} = \dfrac{1 + \cos\beta}{\sin\beta}$

$\dfrac{\sin\beta(1 + \cos\beta)}{(1 + \cos\beta)(1 - \cos\beta)}$

$\dfrac{\sin\beta(1 + \cos\beta)}{\sin^2\beta}$

$\dfrac{1 + \cos\beta}{\sin\beta}$

13) $\dfrac{\cot a}{\csc a - 1} = \dfrac{\csc a + 1}{\cot a}$

$\dfrac{\cot a(\csc a + 1)}{(\csc a - 1)(\csc a + 1)}$

$\dfrac{\cot a(\csc a + 1)}{\cot^2 a}$

$\dfrac{\csc a + 1}{\cot a}$

on HW in book

14) $\dfrac{\tan x + \cot y}{\tan x \cot y} = \tan y + \cot x$

$\dfrac{\tan x}{\tan x \cot y} + \dfrac{\cot y}{\tan x \cot y}$

$\dfrac{1}{\cot y} + \dfrac{1}{\tan x}$

$\tan y + \cot x$

15) $\ln|\sec\theta| = -\ln|\cos\theta|$

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

$\ln(\cos\theta)^{-1}$

$-\ln|\cos\theta|$

16) $-\ln(1+\cos\theta) = \ln(1-\cos\theta) - 2\ln|\sin\theta|$

$= \ln \dfrac{1-\cos\theta}{\sin^2\theta}$

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

$= \ln \dfrac{1}{1+\cos\theta}$

$= \ln(1+\cos\theta)^{-1}$

$= -\ln(1+\cos\theta)$

on HW in book

17) $\dfrac{\csc(-x)}{\sec(-x)} = -\cot x$

$\dfrac{-\csc x}{\sec x}$

$(-\csc x)(\cos x)$

$-\dfrac{1}{\sin x} \cdot \cos x$

$-\cot x$

18) $\dfrac{\cos(-\theta)}{1+\sin(-\theta)} = \sec\theta + \tan\theta$

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

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

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

$\dfrac{1+\sin\theta}{\cos\theta}$

$\dfrac{1}{\cos\theta} + \dfrac{\sin\theta}{\cos\theta}$

$\sec\theta + \tan\theta$