

HM3 classwork - simplifying & verifying

① $\sec \theta \cos \theta$
 $\frac{1}{\cancel{\cos \theta}} \cdot \cancel{\cos \theta}$

1

② $\cot x \sin x$

$\frac{\cos x}{\cancel{\sin x}} \cdot \frac{\cancel{\sin x}}{1}$

$\cos x$

③ $\sin \theta \sec \theta$

$\sin \theta \cdot \frac{1}{\cos \theta}$

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

④ $\sec^2 x + \tan^2 x + \sec^2 x$
* FACTOR!

$\sec^2 x (\tan^2 x + 1)$

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

$\sec^4 x$

⑤ $\tan^4 x + 2\tan^2 x + 1$
* FACTOR!

$(\tan^2 x + 1)(\tan^2 x + 1)$

$\sec^2 x \cdot \sec^2 x$

$\sec^4 x$

$\tan \theta$

⑥ $\sec^2 \theta (1 - \sin^2 \theta)$

$\sec^2 \theta \cdot \cos^2 \theta$

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

1

⑦ $\sec \theta \left(\frac{\sin \theta}{\tan \theta} \right)$

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

$\sec \theta \cdot \sin \theta \cdot \frac{\cancel{\cos \theta}}{\cancel{\sin \theta}}$

$\sec \theta \cos \theta$

$\frac{1}{\cancel{\cos \theta}} \cdot \cancel{\cos \theta}$

1

$$8) \frac{\cos x}{1 + \sin x} + \frac{1 + \sin x}{\cos x}$$

Common denominator: $(1 + \sin x)(\cos x)$

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

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

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

Pythag ID!!

$$\frac{1 + 1 + 2\sin x}{(1 + \sin x)(\cos x)}$$

$$\frac{2 + 2\sin x}{(1 + \sin x)(\cos x)}$$

$$\frac{2(1 + \sin x)}{(1 + \sin x)(\cos x)}$$

$$\frac{2}{\cos x}$$

$$2 \sec x$$

$$\textcircled{1} \frac{\tan^2 \theta + 1}{\cot \theta} = \tan \theta \sec^2 \theta$$

$$\frac{\sec^2 \theta}{\cot \theta} = \tan \theta \sec^2 \theta$$

$$\frac{1}{\cot \theta} \cdot \sec^2 \theta = \tan \theta \sec^2 \theta$$

$$\tan \theta \sec^2 \theta = \tan \theta \sec^2 \theta \quad \text{☺}$$

$$\textcircled{10} \frac{\sec \theta - 1}{\sec \theta} = 1 - \cos \theta$$

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

$$1 - \cos \theta = 1 - \cos \theta \quad \text{☺}$$

$$\textcircled{11} \csc \theta \tan \theta + \cos \theta = \frac{1 + \cos^2 \theta}{\cos \theta}$$

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

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

get a common denominator

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

$$\frac{1 + \cos^2 \theta}{\cos \theta} = \frac{1 + \cos^2 \theta}{\cos \theta} \quad \text{☺}$$