

710 Notes

$$\textcircled{1} \frac{\cancel{\cos \theta}}{1} \frac{\sin \theta \textcircled{A}}{\cancel{\cos \theta}} = \sin \theta \quad (\textcircled{A} \text{ Quotient Id})$$
$$\sin \theta = \sin \theta$$

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$$\textcircled{3} \cos^2 \theta - [\sin^2 \theta] = 2 \cos^2 \theta - 1$$
$$\cos^2 \theta - [1 - \cos^2 \theta] \textcircled{A} = 2 \cos^2 \theta - 1$$
$$1 \cos^2 \theta - 1 + \cos^2 \theta = 2 \cos^2 \theta - 1$$
$$2 \cos^2 \theta - 1 = 2 \cos^2 \theta - 1$$

(A) Pyth Id

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$$\textcircled{5} \frac{1}{1 - \cos^2 \theta} = 1 + \cot^2 \theta$$

(A) Pyth Id

$$\textcircled{A} \frac{1}{\sin^2 \theta} = 1 + \cot^2 \theta$$

(B) Recip. Id

$$\textcircled{B} \csc^2 \theta = 1 + \cot^2 \theta$$

(C) Pyth Id

$$\textcircled{C} 1 + \cot^2 \theta = 1 + \cot^2 \theta$$

$$\textcircled{7} \sin \theta \tan \theta \textcircled{A} = \frac{1 - \cos^2 \theta}{\cos \theta}$$

$$\frac{\sin \theta}{1} \frac{\sin \theta}{\cos \theta} = \frac{1 - \cos^2 \theta}{\cos \theta} \quad \textcircled{A} \text{ Quotient Id}$$

$$\left. \begin{array}{l} \frac{\sin^2 \theta}{\cos \theta} \\ \rightarrow 1 - \cos^2 \theta \textcircled{B} \end{array} \right\} = \frac{1 - \cos^2 \theta}{\cos \theta} \quad \textcircled{B} \text{ Pyth Id}$$


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Method 2

$$\sin \theta \tan \theta = \frac{1 - \cos^2 \theta}{\cos \theta} \textcircled{A} \quad \textcircled{A} \text{ Pyth Id}$$

$$= \frac{\sin^2 \theta}{\cos \theta} \quad \textcircled{B} \text{ Quotient}$$

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

$$= \sin \theta \tan \theta \textcircled{B}$$

$$(9) \frac{\tan^2 \theta}{\sec \theta} = \sec \theta - \cos \theta$$

$$* \textcircled{A} \frac{\sec^2 \theta - 1}{\sec \theta} = \sec \theta - \cos \theta$$

$\textcircled{A}$  Pythagorean

$$\frac{\sec^2 \theta}{\sec \theta} - \frac{1}{\sec \theta}$$

$\textcircled{B}$  Reciprocal

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

$$\sec \theta - \cos \theta \quad \textcircled{B}$$

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$$* \frac{\sec^2 \theta - 1}{\sec \theta} = \sec \theta - \cos \theta$$

$$\frac{(\sec \theta - 1)(\sec \theta + 1)}{\sec \theta} =$$

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$$\frac{\tan \theta}{1} \frac{\tan \theta}{1} \frac{1}{\sec \theta}$$

$$\textcircled{1} \frac{\tan^2 \theta}{\sec \theta} \stackrel{\textcircled{A}}{=} \frac{\sec \theta - \cos \theta}{1}$$

$$\textcircled{A} \text{ Reciprocal} \quad = \frac{1}{\cos \theta} - \frac{\cos \theta}{1}$$

$$\textcircled{B} \text{ Quotient} \quad = \frac{1}{\cos \theta} - \frac{\cos \theta}{1} \frac{\cos \theta}{\cos \theta}$$

$$\textcircled{C} \text{ Reciprocal} \quad = \frac{1}{\cos \theta} - \frac{\cos^2 \theta}{\cos \theta}$$

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

$$= \frac{\sin^2 \theta}{\cos \theta} \left[ \frac{\cos \theta}{\cos \theta} \right]$$

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

$$\textcircled{B} \frac{\tan^2 \theta}{1} \quad \perp \quad \textcircled{C} \frac{\tan^2 \theta}{\sec \theta}$$

$$\begin{aligned}
(3) \quad \cos^2 \theta - \sin^2 \theta &= 2\cos^2 \theta - 1 \\
\cos^2 \theta - [1 - \cos^2 \theta] &= 2\cos^2 \theta - 1 \\
\cos^2 \theta - 1 + \cos^2 \theta &= 2\cos^2 \theta - 1 \\
2\cos^2 \theta - 1 &= 2\cos^2 \theta - 1
\end{aligned}$$

(A) Pyth Id

$$(5) \quad \frac{1}{1 - \cos^2 \theta} = 1 + \cot^2 \theta$$

$$(A) \quad \frac{1}{\sin^2 \theta} = 1 + \cot^2 \theta$$

(A) Pyth. Id

$$(B) \quad \csc^2 \theta = 1 + \cot^2 \theta$$

(B) Reciprocal Id

$$(C) \quad 1 + \cot^2 \theta = 1 + \cot^2 \theta$$

(C) Pyth Id

# 7.1 Trig Id Hwk

(#1)  $\frac{\sin \theta}{\tan \theta} = \cos \theta$

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

$$\frac{\sin \theta}{1} \cdot \frac{\cot \theta}{1} \text{ (A)} = \cos \theta$$

$$\frac{\sin \theta}{1} \cdot \frac{\cos \theta}{\sin \theta} \text{ (B)} = \cos \theta$$

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

$$1 \cdot \cos \theta = \cos \theta$$
$$\boxed{\cos \theta = \cos \theta}$$

(A) Reciprocal Id

(B) Quotient Id

(#3)  $\frac{\tan \theta}{\csc \theta} = \sec \theta - \cos \theta$

$$\frac{\tan \theta}{1} \cdot \frac{1}{\csc \theta} = \sec \theta - \cos \theta$$

$$\text{(A)} \frac{\sin \theta}{\cos \theta} \cdot \frac{1}{\csc \theta} = \sec \theta - \cos \theta$$

$$\frac{\sin \theta}{\cos \theta} \cdot \frac{\sin \theta}{1} \text{ (B)} = \sec \theta - \cos \theta$$

#3 cont

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

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

©  $\frac{1 - \cos^2 \theta}{\cos \theta} = \sec \theta - \cos \theta$

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

$$\sec \theta - \frac{\cos^2 \theta}{\cos \theta} = \sec \theta - \cos \theta$$

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

$$\sec \theta - 1 \cos \theta = \sec \theta - \cos \theta$$

- Ⓐ Quotient Id
- Ⓑ Reciprocal Id
- Ⓒ Pyth Id

## #3 Method ②

$$\frac{\tan \theta}{\csc \theta} = \sec \theta - \cos \theta$$

$$= \textcircled{A} \frac{1}{\cos \theta} - \frac{\cos \theta}{1}$$

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

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

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

$$= \frac{\sin^2 \theta}{\cos \theta} \textcircled{B}$$

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

$$= \textcircled{C} \frac{\tan \theta}{1} \cdot \frac{\sin \theta}{1}$$

$$= \frac{\tan \theta}{1} \cdot \frac{1}{\csc \theta} \textcircled{D}$$

$$= \frac{\tan \theta}{\csc \theta}$$

Ⓐ Reciprocal Id

Ⓑ Pyth Id

Ⓒ Quotient Id

Ⓓ Reciprocal Id



$$\textcircled{5} \cot(-\theta) \cos(\theta) + \sin(\theta) = -\csc\theta$$

$$\textcircled{A} \frac{\cos(-\theta)}{\sin(-\theta)} \frac{\cos(-\theta)}{1} + \sin(-\theta) = -\csc\theta$$

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

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

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

$$\textcircled{B} \frac{1}{\sin(\theta)} = -\csc\theta$$

$$\frac{1}{-\sin\theta} = -\csc\theta$$

$$\frac{-1}{\sin\theta} = -\csc\theta$$

$$\textcircled{C} -\csc\theta = -\csc\theta$$

Ⓐ Quotient  
≠

Ⓑ PyTh Id

Ⓒ Reciprocal  
≠

$$\textcircled{7} \quad (1 - \cos \theta)(1 + \cos \theta) = \frac{1}{\csc^2 \theta}$$

$$\textcircled{A} \quad 1 - \cos^2 \theta = \frac{1}{\csc^2 \theta}$$

$$\textcircled{B} \quad \sin^2 \theta = \frac{1}{\csc^2 \theta}$$

$$\textcircled{C} \quad \frac{1}{\csc^2 \theta} = \frac{1}{\csc^2 \theta}$$

$\textcircled{A}$  DOTS

$\textcircled{B}$  Pyth Id

$\textcircled{C}$  Reciprocal

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$\textcircled{7}$  Method 2

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

$$(1 - \cos \theta)(1 + \cos \theta) = \sin^2 \theta \quad \textcircled{A}$$

$$(1 - \cos \theta)(1 + \cos \theta) = 1 - \cos^2 \theta \quad \textcircled{B}$$

$$(1 - \cos \theta)(1 + \cos \theta) = (1 - \cos \theta)(1 + \cos \theta) \quad \textcircled{C}$$

$\textcircled{A}$  Reciprocal Id

$\textcircled{B}$  Pyth Id

$\textcircled{C}$  DOTS

$$\textcircled{9} (1 - \cos^2 \theta)(1 + \cot^2 \theta) = 1$$

$$\textcircled{A} \sin^2 \theta (1 + \cot^2 \theta) = 1$$

$$\sin^2 \theta \csc^2 \theta \textcircled{B} = 1$$

$$\sin^2 \theta \cdot \frac{1}{\sin^2 \theta} \textcircled{C} = 1$$

$$\frac{\sin^2 \theta}{\sin^2 \theta} = 1$$

$$1 = 1$$

Ⓐ Pyth Id

Ⓑ Pyth Id

Ⓒ Reciprocal Id

$$\textcircled{11} \tan^2 \theta - \sin^2 \theta = \tan^2 \theta \sin^2 \theta$$

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

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

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

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

$$\textcircled{B} \tan^2 \theta \cdot (1 - \cos^2 \theta) =$$

$$\tan^2 \theta \cdot \sin^2 \theta \textcircled{C} = \tan^2 \theta \sin^2 \theta$$

Ⓐ Quotient Id

Ⓑ Quotient Id

Ⓒ Pyth Id

#11 Method 2

$$\begin{aligned}\tan^2 \theta - \sin^2 \theta &= \tan^2 \theta \sin^2 \theta \\ &= \tan^2 \theta (1 - \cos^2 \theta) \text{ (A)} \\ &= \tan^2 \theta - \tan^2 \theta \cos^2 \theta \\ &= \tan^2 \theta - \frac{\sin^2 \theta \text{ (B)}}{\cos^2 \theta} \cos^2 \theta \\ &= \tan^2 \theta - \sin^2 \theta \frac{\cancel{\cos^2 \theta}}{\cancel{\cos^2 \theta}}\end{aligned}$$

$$\boxed{\tan^2 \theta - \sin^2 \theta = \tan^2 \theta - \sin^2 \theta}$$

(A) Pyth Id

(B) Quotient Id