

4-12-18 1st Trig

$$\textcircled{1} \frac{\cos \theta}{\sin \theta \cdot \cot^2 \theta}$$

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

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

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

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

$$\tan \theta$$

$$\textcircled{2} \frac{\tan x \cdot \cos x}{\sin x}$$

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

$$\frac{\sin x}{\sin x}$$

$$1$$

$$\textcircled{3} \quad \cos x \cdot \sec x - \cos x \cdot \cos x$$

$$\cos x (\sec x - \cos x)$$

$$\cos x \left(\frac{1}{\cos x} - \cos x \right) \text{ Truubling}$$

$$\frac{\cos x}{1} \cdot \frac{1}{\cos x} - \cos x \cdot \cos x$$

$$1 - \cos^2 x$$

$$\sin^2 x$$

$$\textcircled{4} \quad \sin x \cdot \csc x \cdot \cos x$$

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

$$\cos x$$

$$\textcircled{5} \quad \tan x \cdot \sec x \cdot \sin x$$

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

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

$$\tan^2 x$$

$$\textcircled{6} \quad \sin x \cdot \cos x \cdot \cot x$$

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

$$\cos^2 x$$

$$\textcircled{7} \quad \sec x \cdot \sin x \cdot \tan x$$

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

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

$$\tan^2 x$$

$$\textcircled{8} \quad (1 - \cos x)(1 + \cos x)$$

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

$$1 - \cos^2 x$$

$$\sin^2 x$$

$$\textcircled{9} \quad \frac{\tan x \cdot \csc x}{\sec x}$$

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

$$\frac{\frac{1}{\cos x}}{\frac{1}{\cos x}} = 1$$

4-12-18 3rd Trig

① $\sin x \cdot \csc x \cdot \cos x$

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

$$\cos x$$

Side note: $\cot x = \frac{1}{\tan x}$

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

② $\sin x \cdot \cot x \cdot \cos x$

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

$$\cos^2 x$$

$$\textcircled{3} \quad \tan x \cdot \cos x \cdot \sin x$$

$$\downarrow$$

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

$$\sin^2 x$$

$$\textcircled{4} \quad \sec x \cdot \sin x \cdot \tan x$$

$$\downarrow \quad \downarrow \quad \downarrow$$

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

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

$$\tan^2 x$$

$$\textcircled{5} \quad \frac{\csc x \cdot \tan x}{\sec x}$$

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

$$\frac{\frac{1}{\cos x}}{\frac{1}{\cos x}} = 1$$

⑥

$$\frac{\cos x}{\cot^2 x \cdot \sin x}$$

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

$$\frac{\frac{\cos x}{1}}{\frac{\cos^2 x}{\sin x}}$$

$$\frac{\frac{\cancel{\cos x}}{1}}{\frac{\sin x}{\cancel{\cos^2 x}}}$$

$$\frac{\sin x}{\cos x}$$

$$\tan x$$

$$\textcircled{7} \quad (1 - \sin x)(1 + \sin x)$$

$$1 + \sin x - \sin x - \sin^2 x$$

$$1 - \sin^2 x$$

$$\cos^2 x$$

$$\textcircled{8} \quad \cos x \cdot \sec x - \cos x \cdot \cos x$$

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

$$1 - \cos^2 x$$

$$\sin^2 x$$

4-12-18 4th Tr:y

$$\tan x = \frac{\sin x}{\cos x}$$

$$\sec x = \frac{1}{\cos x}$$

$$\cot x = \frac{\cos x}{\sin x}$$

$$\csc x = \frac{1}{\sin x}$$

① $\sin x \cdot \csc x \cdot \cos x$

$$\begin{array}{c} \downarrow \\ \frac{\cancel{\sin x}}{1} \cdot \frac{1}{\cancel{\sin x}} \cdot \frac{\cos x}{1} \\ \cos x \end{array}$$

② $\sin x \cdot \cot x \cdot \cos x$

$$\begin{array}{c} \frac{\cancel{\sin x}}{1} \cdot \frac{\cos x}{\cancel{\sin x}} \cdot \frac{\cos x}{1} \\ \cos^2 x \end{array}$$

③ $\tan x \cdot \sin x \cdot \sec x$

$$\begin{array}{c} \downarrow \quad \downarrow \quad \downarrow \\ \frac{\sin x}{\cos x} \cdot \frac{\sin x}{1} \cdot \frac{1}{\cos x} \\ \frac{\sin^2 x}{\cos^2 x} \\ \tan^2 x \end{array}$$

④

$$\tan x \cdot \sin x \cdot \cos x$$

↓

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

$$\sin^2 x$$

⑤

$$\frac{\tan x \cdot \csc x}{\sec x}$$

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

$$\frac{\frac{1}{\cos x}}{\frac{1}{\cos x}} = 1$$

$$(6) \frac{\cos \theta}{\sin \theta \cdot \cot^2 \theta}$$

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

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

$$\frac{\frac{\cos \theta}{1}}{\frac{\cos^2 \theta}{\sin \theta}} \left[\frac{\cancel{\sin \theta}}{\cos^2 \theta} \right]$$

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

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

$$\tan \theta$$

$$(7) \frac{\cos x \cdot \tan x}{\sin x}$$

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

$$\frac{\sin x}{\sin x}$$

$$1$$

$$\textcircled{8} \quad \cos x \cdot \sec x - \cos x \cdot \cos x$$

$$\frac{\cos x}{1} \cdot \frac{1}{\cos x} - \cos^2 x$$

$$1 - \cos^2 x$$

$$\sin^2 x$$