

U4 L1 E1 Trig Ids WS

① $\frac{1}{\tan x} = \cot x$

② $\frac{1}{\sec x} = \cos x$

③ $\frac{1}{\sin x} = \csc x$

④ $\frac{1}{\cos x} = \sec x$

⑤ $\frac{1}{\csc x} = \sin x$

⑥ $\frac{1}{\cot x} = \tan x$

⑦ $\csc^2 x - 1 = \cot^2 x$

⑧ $\csc^2 x - \cot^2 x = 1$

⑨ $1 + \cot^2 x = \csc^2 x$

⑩ $\sin^2 x + \cos^2 x = 1$

⑪ $\tan^2 x - \sec^2 x = -1$

⑫ $1 - \cos^2 x = \sin^2 x$

⑬ $1 - \sin^2 x = \cos^2 x$

⑭ $\cot^2 x + 1 = \csc^2 x$

⑮ $\sec^2 x - 1 = \tan^2 x$

⑰ $\frac{\tan x \cdot \cos x}{\sin x}$

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

$$\tan x \cdot \cot x$$

1

⑱ $\sin x \cdot \cot x$

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

$$\cos x$$

c Problems

⑩ $\sin x \cdot \sqrt{1 + \cot^2 x}$

$$\sin x \cdot \sqrt{\csc^2 x}$$

$$\sin x \cdot \csc x$$

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

1

$$\textcircled{19} \quad \sin x \cdot \csc x$$

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

$$1$$

$$\textcircled{20} \quad \sec x \cdot \cos x$$

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

$$1$$

$$\textcircled{21} \quad \cot x \cdot \tan x$$

$$\frac{1}{\tan x} \cdot \tan x$$

$$1$$

$$\textcircled{22} \quad \cot^2 x - \csc^2 x$$

$$-1$$

$$\textcircled{23} \quad \frac{\cos x}{\cot x \cdot \sin x}$$

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

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

1

$$\textcircled{24} \quad \tan x \cdot \csc x$$

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

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

$$\textcircled{25} \quad \frac{\cos x}{\cot x}$$

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

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

$$\sin x$$

$$\textcircled{26} \quad \frac{\sin x}{\tan x}$$

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

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

$\cos x$

$$\textcircled{27} \quad \frac{\tan^2 x + 1}{\sec^2 x}$$

$$\frac{\sec^2 x}{\sec^2 x}$$

1

$$(28) \sqrt{\tan^2 x + 1}$$

$$\sqrt{\sec^2 x}$$
$$\sec x$$

$$(29) \sqrt{1 - \sin^2 x}$$

$$\sqrt{\cos^2 x}$$
$$\cos x$$

$$^* (30) \frac{\sqrt{1 - \cos^2 x}}{\sqrt{1 - \sin^2 x}}$$

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

$$(31) \frac{1 - \sin^2 x}{\cos^2 x}$$

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

1

$$(32) \frac{1 - \sin^2 x}{\cos x}$$

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

$$\cos x$$

$$(33) \frac{1 - \sin^2 x}{1 - \cos^2 x}$$

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

$$\cot^2 x$$

13 Problems

$$(34) \sec x \cdot \tan x \cdot \csc x$$

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

$$\tan x$$

$$(35) \sin^2 x \cdot \cot x \cdot \csc x$$

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

$$\cos x$$

$$(36) \frac{\tan^2 x}{1 - \sec^2 x}$$

$$\frac{\tan^2 x}{-\tan^2 x}$$

-1

$$(37) \tan^2 x (\csc^2 x - 1)$$

$$\tan^2 x \cdot \cot^2 x$$

1

$$\textcircled{38} \frac{1 - \cos^2 x}{1 + \cos x}$$

$$\frac{(1 - \cos x)(1 + \cos x)}{1 + \cos x}$$

$$1 - \cos x$$

$$\textcircled{39} \frac{\cos^2 x}{1 - \cos^2 x}$$

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

$$\cot^2 x$$

$$\textcircled{40} \frac{\sec^2 x - 1}{\tan x}$$

$$\frac{\tan^2 x}{\tan x}$$

$$\tan x$$

$$\textcircled{41} \frac{\cos^2 x - 1}{\sin^2 x - 1}$$

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

$$\tan^2 x$$

$$\textcircled{42} \cos x (\sec x - \cos x)$$

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

$$1 - \cos^2 x$$

$$\sin^2 x$$

A Problems

$$\textcircled{43} \frac{\tan x + 1}{\sec x}$$

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

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

$$\sin x + \cos x$$

$$\textcircled{44} \frac{\sec x \cdot \tan x}{\tan^2 x + 1}$$

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

$$\sec^2 x$$

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

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

$$\sin x$$

$$\textcircled{45} \quad \frac{\cos^2 x - 1}{\cos^2 x \cdot \tan^2 x}$$

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

$$-1$$

$$\textcircled{46} \quad \frac{\tan x + \cot x}{\cot x}$$

$$\frac{\tan x}{\cot x} + \frac{\cot x}{\cot x}$$

$$\tan^2 x + 1$$

$$\sec^2 x$$

$$\textcircled{47} \quad \frac{\tan x}{\tan x + \cot x}$$

$$\frac{\tan x}{\tan x + \frac{1}{\tan x}} \quad \frac{\tan x}{\tan x}$$

$$\frac{\tan^2 x}{\tan^2 x + 1}$$

$$\frac{\tan^2 x}{\sec^2 x}$$

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

$$\sin^2 x$$

$$\textcircled{48} \quad \sec x \cdot \cot x - \cot x \cdot \cos x$$

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

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

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

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

$$\sin x$$

$$\textcircled{49}$$

$$\sin x \cdot \tan x - \csc x \cdot \tan x$$

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

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

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

$$-\cos x$$

$$\textcircled{50} \frac{\sin^2 x - \tan^2 x}{\tan^2 x \cdot \sin^2 x}$$

$$\frac{\sin^2 x}{\tan^2 x \cdot \sin^2 x} - \frac{\tan^2 x}{\tan^2 x \cdot \sin^2 x}$$

$$\frac{1}{\tan^2 x} - \frac{1}{\sin^2 x}$$

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

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

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

$$-1$$

$$\textcircled{51} \frac{\sin^3 x + \cos^3 x}{1 - \sin x \cos x}$$

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

$$1 - \sin x \cos x$$

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

$$1 - \sin x \cos x$$

$$\sin x + \cos x$$

$$\textcircled{51} \frac{(\sin x + \tan x)^2 + \cos^2 x - \sec^2 x}{\tan x}$$

$$\frac{\sin^2 x + 2 \sin x \tan x + \tan^2 x + \cos^2 x - \sec^2 x}{\tan x}$$

$$\left(\begin{array}{l} \text{Recall: } \sin^2 x + \cos^2 x = 1 \\ \tan^2 x - \sec^2 x = -1 \end{array} \right)$$

$$\frac{2 \sin x \tan x + 1 - 1}{\tan x}$$

$$2 \sin x$$