

M4 4-3 Practice ANSWERS

1.) $\cot x$

2.) $\cos x$

3.) $\csc x$

4.) $\sec x$

5.) $\sin x$

6.) $\tan x$

7.) $\cot^2 x$

8.) 1

9.) $\csc^2 x$

10.) 1

11.) -1

12.) $\sin^2 x$

13.) $\cos^2 x$

14.) $\csc^2 x$

15.) $\tan^2 x$

C Problems

$$\begin{aligned} 16.) &= \sin x \sqrt{\csc^2 x} \\ &= \sin x \cdot \csc x \\ &= \boxed{1} \end{aligned}$$

$$\begin{aligned} 17.) &= \frac{\sin x \cdot \cos x}{\cos x} \\ &= \frac{\sin x}{\sin x} \\ &= \boxed{1} \end{aligned}$$

$$\begin{aligned} 18.) &= \sin x \cdot \frac{\cos x}{\sin x} \\ &= \boxed{\cos x} \end{aligned}$$

$$\begin{aligned} 19.) &= \sin x \cdot \frac{1}{\sin x} \\ &= \boxed{1} \end{aligned}$$

$$\begin{aligned} 20.) &= \frac{1}{\cos x} \cdot \cos x \\ &= \boxed{1} \end{aligned}$$

$$\begin{aligned} 21.) &= \frac{1}{\tan x} \cdot \tan x \\ &= \boxed{1} \end{aligned}$$

$$22.) = \boxed{-1} \rightarrow \begin{aligned} \cot^2 x + 1 &= \csc^2 x \\ \cot^2 x - \csc^2 x &= -1 \end{aligned}$$

$$23.) \frac{\cos x}{\frac{\cos x \cdot \cancel{\sin x}}{\cancel{\sin x}}} = 1$$

$$24.) \frac{\sin x \cdot \cos x}{\cos x} = \sin x$$

$$25.) \frac{\cos x}{\frac{\cos x}{\sin x}} = \cos x \cdot \frac{\sin x}{\cos x} = \sin x$$

$$26.) \frac{\sin x}{\frac{\sin x}{\cos x}} = \cancel{\sin x} \cdot \frac{\cos x}{\cancel{\sin x}} = \cos x$$

$$27.) \frac{\sec^2 x}{\sec^2 x} = 1$$

$$28.) \sqrt{\sec^2 x} = \sec x$$

$$29.) \sqrt{\cos^2 x} = \cos x$$

$$30.) \frac{\sqrt{\sin^2 x}}{\sqrt{\cos^2 x}} = \frac{\sin x}{\cos x} = \tan x$$

technically should be $|\tan x|$

$$31.) \frac{\cos^2 x}{\cos^2 x} = 1$$

$$32.) \frac{\cos^2 x}{\cos x} = \cos x$$

$$33.) \frac{\cos^2 x}{\sin^2 x} = \cot^2 x$$

B Problems

$$34.) = \frac{1}{\cos x} \cdot \frac{\cancel{\sin x}}{\cancel{\cos x}} \cdot \cancel{\cos x} = \tan x$$

$$35.) = \frac{\tan^2 x}{\tan^2 x} = 1$$

$$36.) = \frac{(1 + \cancel{\cos x})(1 - \cancel{\cos x})}{1 + \cos x} = 1 - \cos x$$



B Problems (cont'd.)

$$37.) = \frac{\tan^2 x}{\tan x}$$

$$= \boxed{\tan x}$$

$$38.) = \cos x \left(\frac{1}{\cos x} - \cos x \right)$$

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

$$= \boxed{\sin^2 x}$$

$$39.) = \cancel{\sin^2 x} \cdot \frac{\cos x}{\sin x} \cdot \frac{1}{\cancel{\sin x}}$$

$$= \boxed{\cos x}$$

$$40.) = \tan^2 x (\cot^2 x)$$

$$= \tan^2 x \cdot \frac{1}{\tan^2 x}$$

$$= \boxed{1}$$

$$41.) = \frac{\cos^2 x}{\sin^2 x}$$

$$= \boxed{\cot^2 x}$$

$$42.) = \frac{-\sin^2 x}{-\cos^2 x}$$

$$= \boxed{\tan^2 x}$$

$$44.) = \frac{\frac{1}{\cos x} \cdot \frac{\sin x}{\cos x}}{\sec^2 x}$$

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

$$= \boxed{\sin x}$$

$$45.) = \frac{-\sin^2 x}{\frac{\cos^2 x \cdot \sin^2 x}{\cos^2 x}}$$

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

$$= \boxed{-1}$$

$$46.) = \frac{\frac{1}{\cot x} + \cot x}{\cot x}$$

$$= \frac{1}{\cot x} \cdot \frac{1}{\cot x} + \frac{\cot x}{\cot x}$$

$$= \frac{1}{\cot^2 x} + 1$$

$$= \tan^2 x + 1$$

$$= \boxed{\sec^2 x}$$

$$47.) = \frac{\tan x}{\tan x + \frac{1}{\tan x}} \cdot \frac{\tan x}{\tan x}$$

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

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

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

$$= \boxed{\sin^2 x}$$

A Problems

$$43.) = \frac{\frac{\sin x + 1}{\cos x}}{\frac{1}{\cos x}}$$

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

$$= \boxed{\sin x + \cos x}$$



A Problems (cont'd)

$$48.) = \frac{1}{\cancel{\cos x}} - \frac{\cancel{\cos x}}{\sin x} - \frac{\cos x}{\sin x} \cdot \cos x$$

$$\star = \frac{1}{\sin x} - \frac{\cos^2 x}{\sin x} \rightarrow \left[\frac{1 - \cos^2 x}{\sin x} \right]$$

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

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

$$= \boxed{\sin x}$$

$$49.) \sin x \cdot \frac{\sin x}{\cos x} - \frac{1}{\cancel{\sin x}} \cdot \frac{\cancel{\sin x}}{\cos x}$$

$$\star = \frac{\sin^2 x}{\cos x} - \frac{1}{\cos x} \rightarrow \left[\frac{\sin^2 x - 1}{\cos x} \right]$$

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

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

$$= \boxed{-\cos x}$$

$$50.) = \frac{\cancel{\sin^2 x} (1 - \frac{1}{\cancel{\cos^2 x}})}{\tan^2 x \cdot \cancel{\sin^2 x}}$$

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

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

$$= \boxed{-1}$$



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A Problems (cont'd... again)

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

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

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

$= \frac{2 \sin x \cdot \tan x}{\tan x}$

$= \boxed{2 \sin x}$

52.) $= \frac{(\sin x + \cos x)(\sin^2 x - \sin x \cdot \cos x + \cos^2 x)}{1 - \sin x \cdot \cos x}$

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

$= \boxed{\sin x + \cos x}$