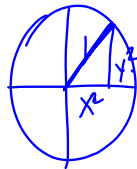


5.1 Trig Identities  
 pg. 445  
 $\tan x = \frac{\sin x}{\cos x}$

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Pythagorean Identities

- ~~\*~~  $\sin^2 \theta + \cos^2 \theta = 1$
- ~~\*~~  $\sin^2 \theta = 1 - \cos^2 \theta$
- ~~\*~~  $\cos^2 \theta = 1 - \sin^2 \theta$



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$1 + \tan^2 \theta = \sec^2 \theta$

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

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

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

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$\cot^2 \theta + 1 = \csc^2 \theta$

$1 = \csc^2 \theta - \cot^2 \theta$

$\cot^2 \theta = \csc^2 \theta - 1$

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9 Use identities to simplify

$\tan x \cos x$

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

$\sin x$

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10  $\cot x \tan x$

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

$1$

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

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

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

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

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

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

$$\tan x$$

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13

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

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

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

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

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11

$$\sec y (\sin(\frac{\pi}{2} - y))$$

$$\sec y \cdot \cos y$$

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

$$1$$

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

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

$$\csc x$$

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39

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

$$u = \cos x$$

$$u^2 + 2u + 1$$

$$(u+1)(u+1)$$

$$\frac{1}{2}$$

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

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$$\textcircled{52} \sqrt{2} \cancel{\tan x} \cos x - \cancel{\tan x} = 0$$

$$\tan x (\sqrt{2} \cos x - 1) = 0$$

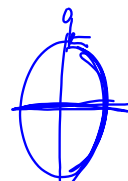
$$\tan x = 0 \quad \sqrt{2} \cos x - 1 = 0$$

$$\frac{\sqrt{2} \cos x = 1}{\sqrt{2}} \quad \frac{1}{\sqrt{2}} \sqrt{2} \cos x = \frac{1}{\sqrt{2}} \sqrt{2}$$

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$$\tan x = 0 \quad \cos x = \frac{\sqrt{2}}{2}$$

$$x = 0, \pi \quad x = \frac{\pi}{4}, \frac{7\pi}{4}$$

$$x = 0, \pi, \frac{\pi}{4}, \frac{7\pi}{4}$$


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S. 1  
 pg. 451  
 # 9-15, 23, 24, 26, 27, 29, 31-35,  
 39, 40, 51, 53, 54

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$$\textcircled{15} \cos x (\sin^2 x)$$

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