

## Cheat Sheet Stuff you should know

Reciprocal IDs

Quotient ID

$$\sin^2 \theta + \cos^2 \theta = 1$$

Cofunction IDs

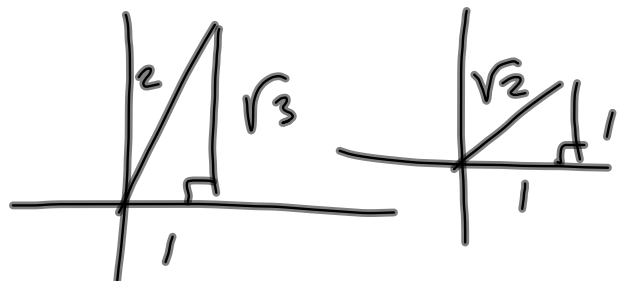
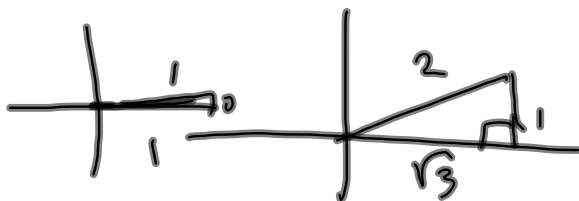
Even/Odd

$$\sin(-x) = -\sin x$$

$$\cos(-x) = \cos x$$

$$\tan(-x) = \frac{\sin(-x)}{\cos(-x)} = \frac{-\sin x}{\cos x} =$$

$$= -\tan x$$



§2.5 7-17, 21-29, 33-41, 45, 49-55

ⓑ  $\sin(2x) \sin(x) = \cos(x)$

$2\sin(x)\cos(x)\sin(x) - \cos(x) = 0$

$\cos x (2\sin^2(x) - 1) = 0$

$\cos x = 0$



$2u^2 - 1$

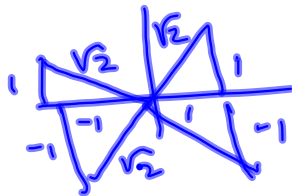
$2u^2 = 1$

$u^2 = \frac{1}{2}$

$\sin x = \pm \sqrt{\frac{1}{2}} = \pm \frac{1}{\sqrt{2}}$



$x = \frac{\pi}{2}, \frac{3\pi}{2}$



$\frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$

$45^\circ, 135^\circ, 225^\circ, 315^\circ$

Find all solutions

$x \in [0, 2\pi)$

check answers.

$\sin(\pi) \sin(\frac{\pi}{2}) = \cos \frac{\pi}{2} ?$

$0 \cdot 1 = 0 \checkmark$

#s 15-20 Use Double-Angle

(20)  $10 \sin^2 x - 5 = 0$

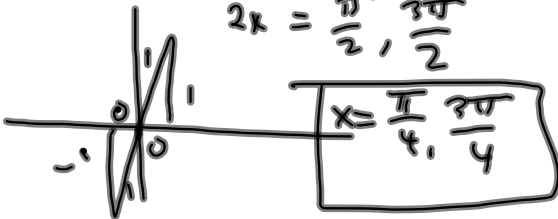
$$= 10 \left( \frac{1 - \cos(2x)}{2} \right) - 5 = 0$$

$$= 5 (1 - \cos(2x) - 1) = 0$$

$$= -5 \cos(2x) = 0$$

$$= \cos(2x) = 0$$

$$2x = \frac{\pi}{2}, \frac{3\pi}{2}$$



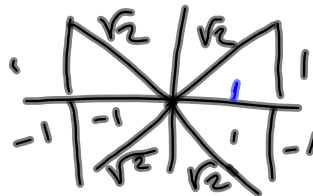
$1 - 2\sin^2 u = \dots$   
I would just do this:

$$\begin{aligned} 10 \sin^2 x &= 5 \\ \sin^2 x &= \frac{1}{2} \\ \sin x &= \pm \frac{1}{\sqrt{2}} \end{aligned}$$

$$1 - 2\sin^2 x = 0$$

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

$$\sin x = \pm \frac{1}{\sqrt{2}}$$

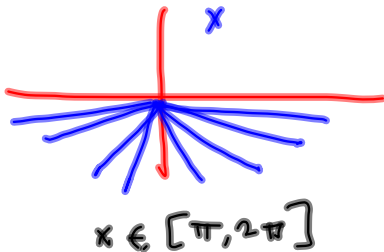


#s 21-24 Find exact value of  $\sin(2u)$ ,  $\cos(2u)$ ,  $\tan(2u)$

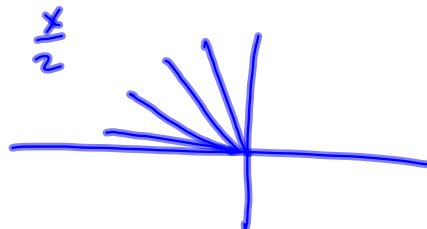
If  $x \in [0, \pi]$ , then  $2x \in [0, 2\pi]$

$\dots$   $x \in [\pi, 2\pi]$ , then  $2x \in [2\pi, 4\pi]$

If  $x \in [\pi, 2\pi]$  then  $\frac{x}{2} \in [\frac{\pi}{2}, \pi]$

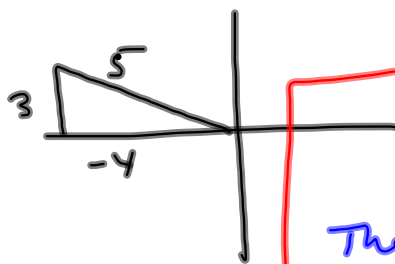
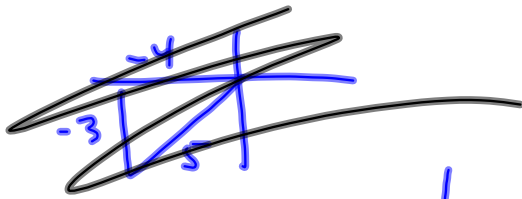
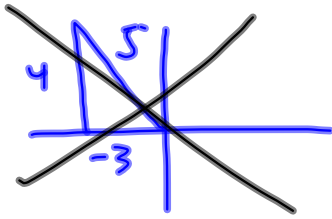


$\sin x < 0$   
 $\cos x < 0$  OR  $\cos x > 0$



$\frac{x}{2} \in [\frac{\pi}{2}, \pi]$  QII  
 $\sin x > 0$   
 $\cos x < 0$

$$\cos(u) = -\frac{4}{5}$$



$\sin(2u), \cos(2u), \tan(2u)$

$$\frac{\pi}{2} < u < \pi$$

is given

Then  $2u$  is going  
be in QIV

$\rightarrow \pi < 2u < 2\pi$   
 $\rightarrow$  Not quite. Might  
be in QIII

$$\sin(2u) = 2 \sin u \cos u$$

$$= 2 \left(\frac{3}{5}\right) \left(-\frac{4}{5}\right) = -\frac{24}{25}$$

$$\cos(2u) = 1 - 2 \sin^2 u \quad \text{4} \rightarrow \sin(2u)$$

$$= 1 - 2 \left(\frac{24}{25}\right)^2$$

$$= \frac{625 - 576}{625} = \frac{49}{625}$$

$$\tan(2u)$$

$$= \frac{-\frac{24}{25} \cdot 625}{49}$$

$$= -\frac{600}{49}$$

Book says  $\sin(2u) = -\frac{24}{25}$

$$625 - 2(576)$$

$$\cos(2u) = \frac{7}{25}$$

$$\cos^2(2u) = 1 - \sin^2(2u)$$

$$\tan(2u) = -\frac{24}{7}$$

$$= 1 - \left(-\frac{24}{25}\right)^2$$

$$= 1 - \frac{576}{625}$$

$$= \frac{625 - 576}{625}$$

$$= \frac{49}{625} = \cos^2(2u)$$

$$\cos(2u) = \frac{7}{25}$$

$$\tan(2u) = \frac{\sin(2u)}{\cos(2u)} = \frac{-\frac{24}{25}}{\frac{7}{5}} = -\frac{24}{25} \cdot \frac{5}{7} = -\frac{24}{7}$$