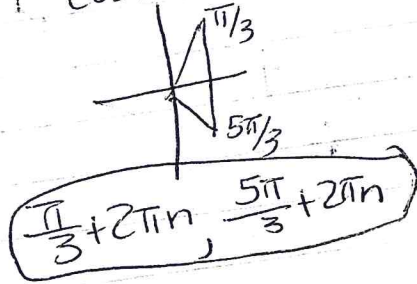
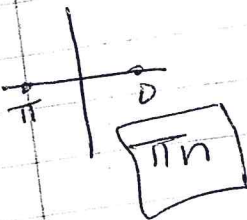
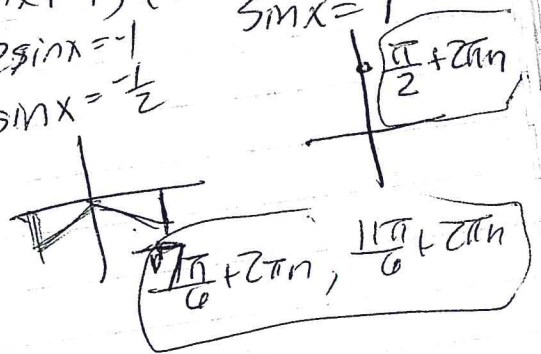


pp 378-9 HW#1 pp 388-9: 7-10, 21-24, 41-44, 75, 76

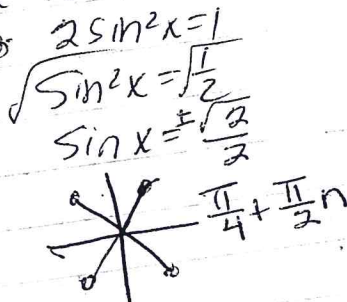
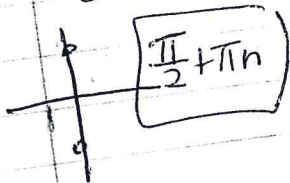
7) $\sin 2x - \sin x = 0$
 $2\sin x \cos x - \sin x = 0$
 $\sin x (2\cos x - 1) = 0$
 $\sin x = 0$ $2\cos x - 1 = 0$
 $\cos x = \frac{1}{2}$



10) $\cos 2x + \sin x = 0$
 $1 - 2\sin^2 x + \sin x = 0$
 $2\sin^2 x - \sin x - 1 = 0$
 $(2\sin x + 1)(\sin x - 1) = 0$
 $2\sin x = -1$ $\sin x = 1$
 $\sin x = -\frac{1}{2}$



8) $\sin 2x \sin x = \cos x$
 $2\sin x \cos x \cdot \sin x = \cos x$
 $2\sin^2 x \cos x - \cos x = 0$
 $\cos x (2\sin^2 x - 1) = 0$
 $\cos x = 0$ $2\sin^2 x = 1$
 $\sin^2 x = \frac{1}{2}$
 $\sin x = \pm \frac{\sqrt{2}}{2}$



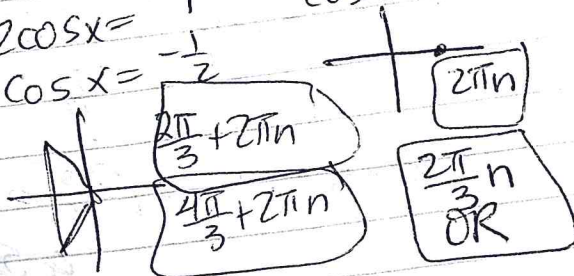
21) $\sin u = -\frac{3}{5}$

$\cos u = \frac{4}{5}$
 $\tan u = -\frac{3}{4}$

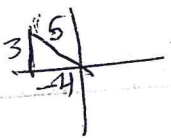
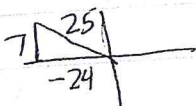
$\sin 2u = 2 \sin u \cos u$
 $= 2 \cdot \left(-\frac{3}{5}\right) \cdot \frac{4}{5}$
 $= \frac{-24}{25}$

$\cos 2u = \cos^2 u - \sin^2 u$
 $= \left(\frac{4}{5}\right)^2 - \left(-\frac{3}{5}\right)^2$
 $= \frac{16}{25} - \frac{9}{25} = \frac{7}{25}$
 $\tan 2u = \frac{2 \tan u}{1 - \tan^2 u} = \frac{2 \cdot \left(-\frac{3}{4}\right)}{1 - \frac{9}{16}}$
 $= \frac{-\frac{3}{2}}{\frac{7}{16}} = \frac{-\frac{3}{2} \cdot \frac{16}{7}}{1} = \frac{-24}{7}$

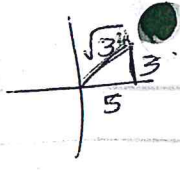
9) $\cos 2x - \cos x = 0$
 $2\cos^2 x - 1 - \cos x = 0$
 $2\cos^2 x - \cos x - 1 = 0$
 $(2\cos x + 1)(\cos x - 1) = 0$
 $2\cos x = -1$ $\cos x = 1$
 $\cos x = -\frac{1}{2}$



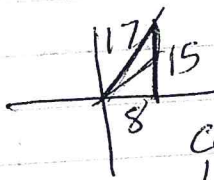
OR

22) $\cos u = -\frac{4}{5}$ 
 $\sin u = \frac{3}{5}$
 $\tan u = -\frac{3}{4}$ 

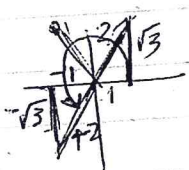
$\sin 2u = \frac{7}{25}$
 $\cos 2u = -\frac{24}{25}$
 $\tan 2u = -\frac{7}{24}$

23) $\tan u = \frac{3}{5}$ 
 $\cos u = \frac{4}{5}$
 $\sin u = \frac{3}{5}$

$\sin 2u = 2 \sin u \cos u$
 $= 2 \cdot \frac{3}{5} \cdot \frac{4}{5} = \frac{24}{25}$
 $\cos 2u = \cos^2 u - \sin^2 u = \frac{16}{25} - \frac{9}{25} = \frac{7}{25}$
 $\tan 2u = \frac{\sin 2u}{\cos 2u} = \frac{24}{7}$


 $\cos 2u = \frac{24}{25}$
 $\tan 2u = \frac{7}{24}$

24) $\sec u = -2$
 $\cos u = -\frac{1}{2}$
 $\sin u = -\frac{\sqrt{3}}{2}$
 $\tan u = \sqrt{3}$



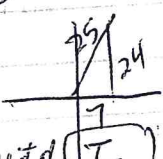
$r^2 + b^2 = 2^2$

$\sin 2u = 2 \sin u \cos u$
 $= 2 \cdot \left(-\frac{\sqrt{3}}{2}\right) \cdot \left(-\frac{1}{2}\right) = \frac{\sqrt{3}}{2}$

$\cos 2u = -\frac{1}{2}$
 $\tan 2u = -\sqrt{3}$

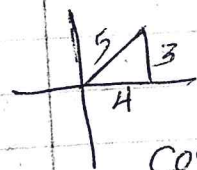
$u = \frac{4\pi}{3}$ $2u = \frac{8\pi}{3} = \frac{2\pi}{3}$
 $180 + 60 = 240^\circ$
 $= 480$
 $= 360 + 120$
 $= \text{Quadrant II}$



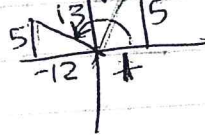
41) $\cos u = \frac{7}{25}$ 
 a) $\frac{1}{2}u$ also in Quadrant I positive

b) $\sin \frac{u}{2} = \sqrt{\frac{1 - \cos u}{2}}$

$= \sqrt{\frac{1 - \frac{7}{25}}{2}} = \sqrt{\frac{\frac{18}{25}}{2}} = \sqrt{\frac{9}{25}} = \frac{3}{5}$



$\cos \frac{u}{2} = \frac{4}{5}$
 $\tan \frac{u}{2} = \frac{3}{4}$

42) $\sin u = \frac{5}{13}$ 
 $\cos u = -\frac{12}{13}$
 $\tan u = -\frac{5}{12}$

a) Quadrant I positive

$\sin \frac{u}{2} = \sqrt{\frac{1 - \cos u}{2}}$
 $= \sqrt{\frac{1 - (-\frac{12}{13})}{2}} = \sqrt{\frac{1 + \frac{12}{13}}{2}}$

$\cos \frac{u}{2} = \sqrt{\frac{1 + \cos u}{2}}$
 $= \sqrt{\frac{1 + (-\frac{12}{13})}{2}} = \sqrt{\frac{1 - \frac{12}{13}}{2}}$

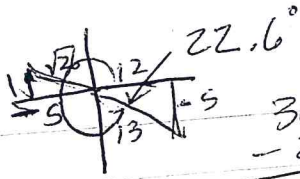
$\tan \frac{u}{2} = 5 = \frac{\sin \frac{u}{2}}{\cos \frac{u}{2}} = \frac{\sqrt{\frac{1 + \frac{12}{13}}{2}}}{\sqrt{\frac{1 - \frac{12}{13}}{2}}} = \frac{\sqrt{25}}{\sqrt{1}} = 5$
 $\frac{5\sqrt{26}}{26}$

$$43) \tan u = \frac{-5}{12}$$

$$\sin \frac{u}{2} = \frac{1}{\sqrt{26}} = \frac{\sqrt{26}}{26}$$

$$\cos \frac{u}{2} = \frac{-5}{\sqrt{26}} = \frac{-5\sqrt{26}}{26}$$

$$\tan \frac{u}{2} = -\frac{1}{5}$$



$$\frac{360 - 22.6}{337.4} / 2 = 168.7^\circ \text{ Quad II}$$

$$44) \cot u = 3$$

$$\tan u = \frac{1}{3}$$

$$\sin u = \frac{-1}{\sqrt{10}} = \frac{-\sqrt{10}}{10}$$

$$\cos u = \frac{-3}{\sqrt{10}} = \frac{-3\sqrt{10}}{10}$$

$$\frac{u}{2} = \text{Quad 2}$$

~~Quad~~

$$\sin \frac{u}{2} = \sqrt{\frac{1 - \cos u}{2}}$$

$$= \sqrt{\frac{1 + \frac{3\sqrt{10}}{10}}{2}} = \sqrt{\frac{\frac{10 + 3\sqrt{10}}{10}}{2}}$$

$$\sqrt{\frac{10 + 3\sqrt{10}}{10}} \cdot \frac{1}{2} = \sqrt{\frac{10 + 3\sqrt{10}}{20}} = \frac{1}{2} \sqrt{\frac{10 + 3\sqrt{10}}{5}}$$

$$\cos \frac{u}{2} = \frac{1}{2} \sqrt{\frac{10 - 3\sqrt{10}}{5}}$$

$$\tan \frac{u}{2} = \frac{\frac{1}{2} \sqrt{\frac{10 + 3\sqrt{10}}{5}}}{\frac{1}{2} \sqrt{\frac{10 - 3\sqrt{10}}{5}}} = \frac{\frac{10 + 3\sqrt{10}}{10}}{\frac{10 - 3\sqrt{10}}{10}} = \frac{10 + 3\sqrt{10}}{10 - 3\sqrt{10}}$$

$$74) \cos u = \frac{\sqrt{2}}{2} \quad \cos 2u = 0$$

$$\sin u = \frac{\sqrt{2}}{2} \quad \sin 2u = 1$$

$$\sin 2u = 2 \cdot \frac{\sqrt{2}}{2} \cdot \frac{\sqrt{2}}{2} = \frac{2}{2} = 1$$

$$\sin 2u = 1$$

$$\cos 2u = \cos^2 u - \sin^2 u$$

$$0 = \left(\frac{\sqrt{2}}{2}\right)^2 - \left(\frac{\sqrt{2}}{2}\right)^2$$

$$0 = 0$$

$$75) \sin(-2x) = -2\sin x \cos x$$

$$\begin{aligned} & \left(\begin{array}{l} 2\sin(-x) \cos(-x) \\ -2\sin(x) \cos(x) \end{array} \right) \text{ True} \end{aligned}$$