

pg. 584-585

HW 8-6

21) $0, \pi, \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$

22) 3.461, 5.964

Fri: Test

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50) $\frac{1}{2}$

53) $\frac{\sqrt{2}}{2}$

55) $\frac{-7}{25}$

61) $0, \pi$

65) .864, 4.006, 2.972, 6.114

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pg. 584-585
 21) $0, \pi, \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$
 PAGE 589-590
 50) $\frac{1}{2}$
 53) $\frac{\sqrt{2}}{2}$
 55) $\frac{-7}{25}$
 61) $0, \pi$
 22) 3.461, 5.964

21) $\sin 2x \cos x - \sin x = 0$
 $\sin 2x = 2 \sin x \cos x$
 $2 \sin x \cos x \cos x - \sin x = 0$
 $2 \sin x \cos^2 x - \sin x = 0$
 $\sin x (2 \cos^2 x - 1) = 0$
 $\sin x = 0 \quad \cos^2 x = \frac{1}{2}$
 $\cos x = \pm \frac{\sqrt{2}}{2}$
 $x = 0, \pi, \frac{\pi}{4}, \frac{3\pi}{4}$
 $\alpha = \frac{\pi}{4}$

61) $\sin^2 x - 7 \sin x = 0$
 $\sin x (\sin x - 7) = 0$
 $\sin x = 0$
 $x = 0, \pi$

65) $6 \tan^2 x = 5 \tan x + \sec^2 x$
 $6 \tan^2 x - 5 \tan x - \sec^2 x = 0$
 $6 \tan^2 x - 5 \tan x - (\tan^2 x + 1) = 0$
 $5 \tan^2 x - 5 \tan x - 1 = 0$
 $\tan x = \frac{5 \pm \sqrt{45}}{10}$
 $\tan x = \frac{5 + \sqrt{45}}{10} = 1.1708$
 $\alpha = .8639$
 $\pi : .8639$
 $\pi : 4.0055$
 $\tan x = \frac{5 - \sqrt{45}}{10} = -.1788$
 $\alpha = .16918$
 $\pi : 2.9724$
 $\pi : 6.1140$

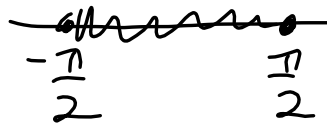
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$$S3) \cos(\sin^{-1}(\frac{\sqrt{2}}{2}))$$

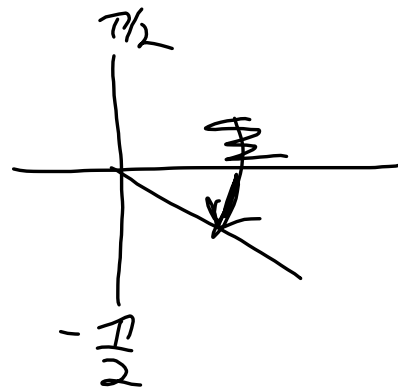
$$\cos(\frac{\pi}{4}) = \frac{\sqrt{2}}{2}$$

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

$$\cos(-\frac{\pi}{4}) = +\frac{\sqrt{2}}{2}$$



cos -	sin + cos + tan +
X	sin - tan -



Feb 9-9:29 AM

Solve for $[0, 2\pi)$ PreCalc
Chpt 8 day 6

Trig Equations Mixed Problems:

$$1. \quad 2 \cos \theta + 5 = 4 \cos \theta + 6$$

$$\frac{-2 \cos \theta}{-2} = \frac{-2 \cos \theta}{-2}$$

$$\frac{5}{-2} = \frac{2 \cos \theta + 6}{-2}$$

$$-1 = 2 \cos \theta$$

$$\cos \theta = -\frac{1}{2}, \quad \alpha = \frac{\pi}{3}$$

$$\text{II: } \theta = \pi - \frac{\pi}{3} = \frac{2\pi}{3}$$

$$\text{III: } \theta = \pi + \frac{\pi}{3} = \frac{4\pi}{3}$$

$$2. \quad \text{Solve } \tan^2 \theta = \tan \theta$$

$$\tan^2 \theta - \tan \theta = 0$$

$$\tan \theta (\tan \theta - 1) = 0$$

$$\tan \theta = 0$$

$$\tan \theta = 1$$

$$\alpha = \frac{\pi}{4}$$

$$\text{I: } \theta = \frac{\pi}{4}$$

$$\text{III: } \theta = \pi + \frac{\pi}{4} = \frac{5\pi}{4}$$



$$0, \pi, 2\pi$$

$$\left\{ \frac{2\pi}{3}, \frac{4\pi}{3} \right\}$$

$$\left\{ 0, \pi, \frac{\pi}{4}, \frac{5\pi}{4} \right\}$$

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3. Solve $\sin^2\theta - 4\sin\theta + 1 = 0$

$$\sin\theta = \frac{-(-4) \pm \sqrt{16 - 4(1)(1)}}{2(1)} = \frac{4 \pm \sqrt{16-4}}{2} = \frac{4 \pm \sqrt{12}}{2}$$

$$\sin\theta = \frac{4 + \sqrt{12}}{2} = 3.73$$

impossible

reject

$$-1 \leq \sin\theta \leq 1$$

$$\sin\theta = \frac{4 - \sqrt{12}}{2} = .267949$$

$$\alpha = \sin^{-1}(\text{2nd Ans}) = .27126$$

$$\text{I: } \theta = .2713$$

$$\text{II: } \theta = \pi - \alpha = 2.8703$$

$$\{.2713, 2.8703\}$$

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4. $\sin^2\theta + \cos\theta + 1 = 0$

$$1 - \cos^2\theta + \cos\theta + 1 = 0$$

$$-\cos^2\theta + \cos\theta + 2 = 0$$

$$\cos^2\theta - \cos\theta - 2 = 0$$

$$(\cos\theta - 2)(\cos\theta + 1) = 0$$

$$\cos\theta = 2 \quad \cos\theta = -1$$

$$\emptyset$$

$$\theta = \pi$$

$$\{\pi\}$$

$$\pi$$

5. $\csc^2 x = 2 \cos x \csc x$

$$2 \cos x \csc x - \csc x = 0$$

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

$$\csc x = 0 \quad \cos x = \frac{1}{2}$$

$$\sin x = \frac{1}{0}$$

$$\emptyset$$

$$\alpha = \frac{\pi}{3}$$

$$x_1 = \frac{\pi}{3}$$

$$x_{iv} = \frac{5\pi}{3}$$

$$\left\{ \frac{\pi}{3}, \frac{5\pi}{3} \right\}$$

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6. a) $\sin 2x - \sin x = 0$ XO Substitute $\sin 2x = 2 \sin x \cos x$

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

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

$\sin x = 0$  $0, \pi$	$\cos x = 1/2$ $x = \pi/3$ <u>I</u> : $\pi/3$ <u>IV</u> : $5\pi/3$
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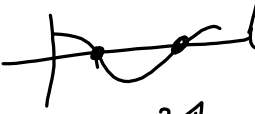
$\{0, \pi, \pi/3, 5\pi/3\}$

Jan 31-1:02 PM

6b. $\sin 2x + \cos x = 0$

$$2 \sin x \cos x + \cos x = 0$$

$$\cos x (2 \sin x + 1) = 0$$

$\cos x = 0$  $x = \frac{\pi}{2}, \frac{3\pi}{2}$	$2 \sin x = -1$ $\sin x = -1/2, x = 7\pi/6$ <u>III</u> : $x = \pi + \pi/6 = 7\pi/6$ <u>IV</u> : $x = 2\pi - \pi/6 = 11\pi/6$
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$\{ \frac{\pi}{2}, \frac{3\pi}{2}, \frac{7\pi}{6}, \frac{11\pi}{6} \}$

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7. $\sec^2 x - 4 = 0$

$$\sec^2 x = 4$$

$$\cos x = \pm \frac{1}{2}$$

$$\alpha = \frac{\pi}{3}$$

$$\left\{ \frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3} \right\}$$

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Feb 5-11:30 AM